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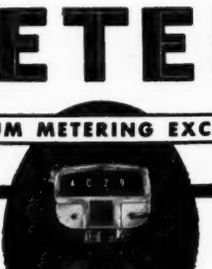
fueloil & oil heat

WITH FARM ROUTES established on the basis of the number of tractors to be served, handling time is the principal factor on which sales coverage and daily gallonage volume are determined. Equipped with Brodie Quantrol Meters, each rural delivery truck can serve many times the number of *tractor-farms* than could be served by the slow man-killing method of hand bucketing. The fully automatic delivery control of Brodie Quantrol Meters enables one tank wagon salesman to make fast accurate transfers to elevated storage tanks, drums in oil sheds, and other inaccessible or out-of-the-way places where long hose discharge is required. All the salesman has to do is pre-set the desired number of gallons to be delivered—and then open the valve. When the exact gallonage has passed through the meter, it shuts off automatically. To obtain maximum coverage of the farm market, equip your tank trucks with Brodie Quantrol Meters. Get full details today.

BRODIE METER EQUIPPED WITH BRODIMATIC QUANTROL... For Fully Automatic Quantity Control

BRODIE METERS

PETROLEUM METERING EXCLUSIVELY



SINCE 1927

RALPH N. BRODIE CO., Inc.
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REPRESENTATIVES AND STOCKS IN ALL PRINCIPAL CITIES

VOL. 5 NO. 5

fueloil & oil heat

SEPTEMBER

1946

Names in the News

W. A. (*Bill*) *Matheson, Jr.* has been named assistant manager of contract sales by Williams Oil-O-Matic Div., Eureka Williams Corp., Bloomington, Ill., to work with Ray G. Pinkerton, head of the department. After graduating from Lehigh University in 1941, the younger Matheson worked in the Oil-O-Matic plant until June 1942 when he left to go into war work as civilian engineering aide at Philadelphia's Frankfort Arsenal. Inducted into the Army in September 1943, Matheson was discharged in June of this year as a first lieutenant.

George B. Coffey has been named manager of the Chicago Division of A. M. Byers Company, with offices in the Conway Building. Mr. Coffey succeeds W. A. Taylor who has resigned to enter private business.

Colonel James H. Wright, a key man in fueling U. S. war equipment in Europe and later deputy director of Fuels and Lubricants Div., Office of Quartermaster General, has returned to civilian oil activity as assistant to the vice-president in charge of operations, Wiley H. Butler, of Coastal Oil Co., Newark, N. J. Serving almost six years in the Army, Butler entered as a 1st Lieutenant reservist and because of oil industry experience was soon transferred to Quartermaster Corps. At one time he was both Petroleum Officer of the European Theatre and Area Petroleum Officer of the Army-Navy Petroleum Board. Landing on Normandy on D-Day he served through the French campaigns,

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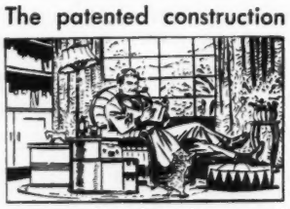
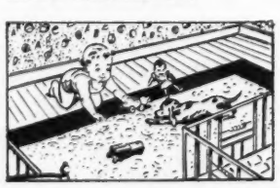
For Economical Quick Heat

The home builder of today plans his house carefully—a vital part of those plans being the heating unit. Before installation, the advantages of a KOVEN WATERFILM BOILER deserve consideration.

The patented construction of KOVEN WATERFILM BOILERS, the fastest steaming boilers on the market, incorporates all the newest scientific improvements—assuring a plentiful supply of hot water, abundant heat and even room temperature—*all at economical operating cost.*



Attractively jacketed, KOVEN WATERFILM BOILERS are made for automatic firing with oil, stoker or gas and are available in a variety of models to suit small or large homes, apartment houses and industrial plants. Write for detailed information.



Even Room Temperature Throughout The House!

Waterfilm Boilers, Inc.
154 Ogden Avenue, Jersey City 7, N. J.
Plants: Jersey City, N. J. • Dover, N. J.

acquiring six battle stars among his decorations, and was wounded in the Battle of the Bulge. At Paris he was in charge of all petroleum distribution for the advancing armies of Northern Europe.

J. G. Campbell heads the newly formed economics and statistic department of Shell Oil Co., Inc., New York. Before joining Shell in the summer of 1941 Campbell was for five years manager of the statistical department of Joseph Walker & Sons, investment firm. He was in the Navy from 1944 until recent discharge, spending 14 months in the Pacific as Deck, Division and Watch Officer, participating in six operations.

D. F. Roloff, H. K. Pritchard, and *C. Stonehill* have been named to major sales positions in the newly-created Specialty Transformer Division of the General Electric Company. Mr. Roloff, formerly Assistant Manager Sales of the old Specialty Transformer Section, has been appointed Assistant Manager of the new Division. Mr. Pritchard and Mr. Stonehill have been named Manager Sales, respectively, of the General Purpose Components Section and the Lighting Components Section. All three men have had long association with the specialty transformer business.

Dr. W. M. Shafer, until recently a member of the Research and Metallurgical Staffs of Fansteel Metallurgical Corporation, North Chicago, Illinois, is now with the Research Department of The National Radiator Company. Dr. Shafer was graduated from the University of Illinois and later obtained a Ph. D. degree in Chemistry and Metallurgy. His new assignment with The National Radiator Company will include metal powder research for the firm's Plastic Metals Division, pioneers in the field of powder metallurgy in addition to research on the company's heating and industrial products.

"Why I Like to Recommend Shell Fuel Oil..."

"IT'S natural for new users to ask me, their oil burner dealer, what fuel oil I recommend ... what I use myself.

"Years ago, when I was trying out various fuel oils, my answer to this question wasn't very helpful to my customers. Today, it's different. I'm using only Shell Fuel Oil, and I can give my reasons.

"I've watched Shell ever since they established that laboratory in New Jersey... back in the twenties. They set out to get the facts about oil burners... tested dozens of makes... took the lead in setting up standards that definitely were needed.

"They make Shell Fuel Oil today just as carefully as gasoline. I happen to know that Shell uses a special chemical filtration process, and they check fuel oil 30 times between laboratory and oil burner. This means a lot less trouble from clogged jets.

"This all adds up to the reason why I like to recommend Shell Fuel Oil... I feel I'm doing my customer *and* myself a service."

RESEARCH PAYS OFF!

Efficient New Combustion Head Available to Oil Burner Makers

Manufacturers of domestic oil burners are keenly interested in the unique gun-type combustion head developed by Shell's fuel oil and oil burner testing laboratory at Sewaren, New Jersey.

By enabling burner makers to guarantee smokeless combustion with up to 14.5% CO_2, the new design is expected to improve substantially the competitive position of fuel oil heat, particularly in smaller burner sizes.

Complete information and details of the licensing arrangements for this patented design may be obtained by writing Shell Development Co., Incorporated, 50 West 50th St., New York 20, N. Y.

SHELL

SHELL FUEL OIL

fueloil & oil heat

Editorial Leaks

One of the advantages of standing at the crossroads of an industry is the entertainment of watching the parade, and frequently people go out of their way to give you a laugh. One such recent laugh came out of a tattered and yellow sheet of the *New York American* of Nevember 9, 1919, containing a headline, "Great Hotels Will Use Oil as Fuel Soon."

The news story relates that many building operations had been delayed in the city until fueloil can be used for heating. Colonel John P. Leo, chairman of the Board of Standards and Appeals, is quoting as saying that such a revolutionary change is now possible, since rules have been adopted to permit the storage of fueloil. Mayor Hylan, early in June of that year, had requested the Board to "investigate the feasibility of making substitutes for coal available to consumers in this city," and after many hearings through the summer and fall, the fueloil rules were adopted November 11, and became effective on December 1, 1919.

There is no doubt that Colonel Leo was sincere when he said the new rules would free the citizens "from the exactions of any fuel monopoly," but his various successors seem to have lost sight of that original goal. Few cities in the country are so afraid of a gallon of fueloil as New York. The original rules have been amended many times; sometimes for visible cause, and sometimes for causes that are more sinister and obscure. It is hard, for instance, to understand why low voltage wiring must be run in rigid tubing; or why walls have to be built around basement tanks; or why fueloil preheaters have to have double coils. Regulations for the storage of dynamite in the city are less exacting than those for storing oil.

New York City is not alone as an offender against common sense. When oilheating was new and untried it is understandable that extreme caution should be the rule, but after nearly thirty years of experience across the country, thirty years in which fueloil has been proved a safe and reliable fuel, it is time to review the many ordinances and revise them to more closely fit the hazards.

The public, in the final analysis, has to pay for the favors the many rules grant to "protected" fuels and companies.

◈

That new 5.5% increase in the ceiling price of oilburners will be a help, but will be far short of what is necessary to allow a profit in these hectic days of hunting for required materials.

A small manufacturer recently told of his quest for castings. Old suppliers are much too busy to cast burner bases, and it requires a bribe to get the patterns out of the loft. Then, patterns in hand, he started looking for a foundry that would pour iron for him. Two of them tried, failed and gave up.

Finally the manufacturer took his patterns back to his old foundry, and in a "deal" with the foreman he is getting a few bases through. Besides paying top price for the iron poured, he has to tip the foreman $10, and each man who works on the job $1, for every base cast. It makes his casting a little expensive, he explains, but dollars and cents are no bar to getting materials.

Magnet wire, worth 40 cents a pound, is going for as high as $1.50 when it can be found at all, and motors wound from this wire hardly can be sold for a profit at ceiling prices.

When such foolishness will stop, nobody is willing to say, but most informed men feel that things are going to be easier by the first of the year.

◈

Unemployment has hit the oilheating business—and hit it at the top. After five years at hard labor, two eastern oilheating partners find themselves out of a job in their own company. It comes about like this:

Last spring these prominent partners decided that some hard selling would be necessary this summer, and cast about them for promising raw material. The quest narrowed down to plain raw material of any quality, and finally was abandoned. Nobody seemed to want to sell oilburners, so they shifted the line of thought. They could hire clerks who could be trained to dispatch oil trucks, route service men, and keep the books. Freed of the drudgery of inside detail, they reasoned, the two of them could sell more oilburners than a dozen green salesmen, so they hired and trained a few smart boys to take over the jobs that had kept them busy since the war started. The hunch was right and they sold oilburners much faster than there was any hope of installing them; so fast, in fact, that they had to stop selling about the first of June. No burners were coming through.

Today our heroes are spending their afternoons in the baseball park, at the races, and playing golf. The business is doing very well in the hands of the new men, and the principals are out of work.

When interviewed, however, the partners grinned and counted their personal "earnings" of recent days. With friends and casual acquaintances they have been playing a game called, "Bettcha ten he doesn't see first base," or sometimes, "Twenty bucks this is my hole." The weather has been fair, and the gods have been kind, but these fellows are looking forward to the day they will get oilburners to sell.

Unemployment—even easy unemployment—is hard to take.

◈

The shortage of 275-gallon tanks, present now in some sections and threatened in others, is discussed in detail in the "Trends" section of this issue. Through normal industry channels the worst of the shortage should be over by October 1 and there is little probability that Government will provide the temporary relief needed except in a very limited way where veterans housing is affected.

But this month's study shows that many thousands of these tanks have been installed in homes where burners were ordered, but for which the burners themselves are not yet available. This was done either to keep high priced installation men busy or, in a few instances, to prevent cancellation of insecure orders. But for the advance installation of so many tanks they would be relatively plentiful today. It would be well for dealers to use caution by holding back on tank installations until sure that complete installations can be made, to avoid the later probability of having to hold burners in the shop while searching for tanks.

5 minutes saved at every stop!

Scully VENTALARM installed on the customer's fuel oil tank saves 5 to 7 minutes at each stop.

TYPE LA

VENTALARM permits the driver to deliver oil without entering the home—eliminates non-delivery stops — relieves customer of all bother.

TYPE LC

Two types of VENTALARM: Type LA for new installations. Type LC for tanks already installed. No threading of old vent pipe necessary.

—that's 1 hour saved in twelve stops

—that's 1½ to 2 hours of driver's time and truck time saved every working day on every truck in operation

—that's cutting down delivery costs

—that's building profits!

SCULLY **VENTALARM**

T. M. REG. U. S. PAT. OFF.

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SCULLY SIGNAL COMPANY

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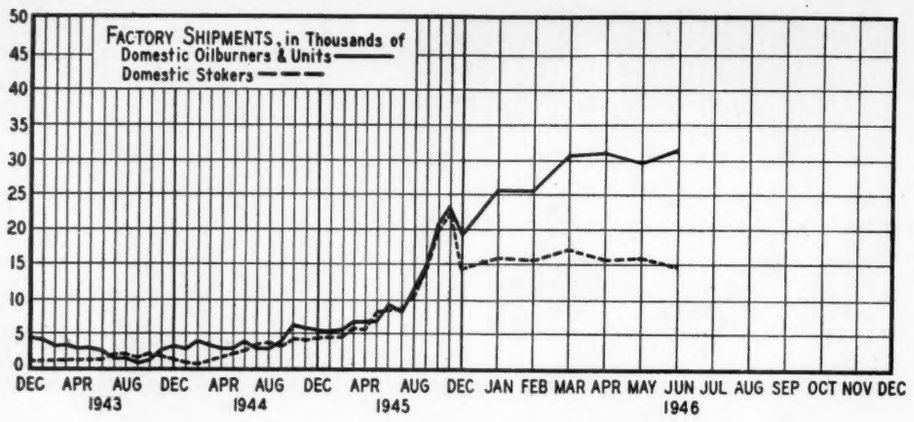
Manufactured in Canada by Empire Brass Mfg. Co., Ltd., London, Ontario

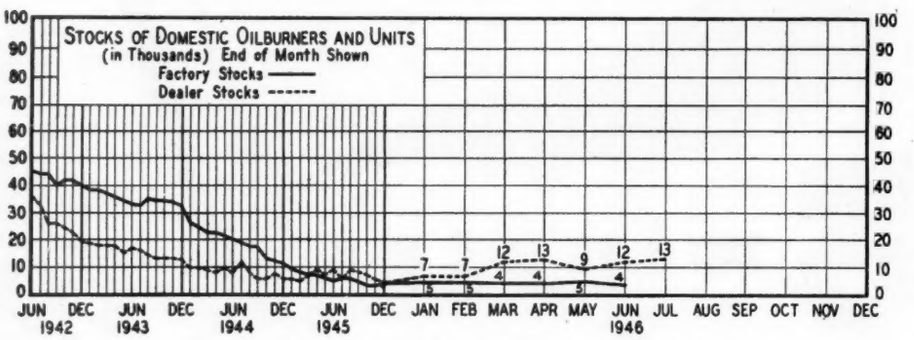
fueloil & oil heat


FACTORY SHIPMENTS, in Thousands of
Domestic Oilburners & Units
Domestic Stokers
DEC APR AUG DEC APR AUG DEC APR AUG DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1943
1944
1945
1946

Shipments of Oilburners and Units

Adjusted to include manufacturers other than the 124 reporting to Census Bureau, FUELOIL & OIL HEAT's estimates of shipments are:

	JUNE			SIX MONTHS		
	1946	1945	Percent Change	1946	1945	Percent Change
Conversion	27,308	8,131	+235.8	156,267	33,030	+373.1
Boiler units	2,350	896	+162.2	7,825	4,420	+ 77.0
Furnace units	1,892	964	+ 96.3	10,329	4,648	+122.2
All domestic	31,550	9,991	+215.7	174,421	42,098	+313.3
Commercial	3,328	2,657	+ 25.3	16,714	19,205	— 13.0
Total	34,878	12,648	+175.8	191,135	61,303	+211.8


STOCKS OF DOMESTIC OILBURNERS AND UNITS
(in Thousands) End of Month Shown
Factory Stocks
Dealer Stocks
JUN DEC JUN DEC JUN DEC JUN DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1942
1943
1944
1945
1946

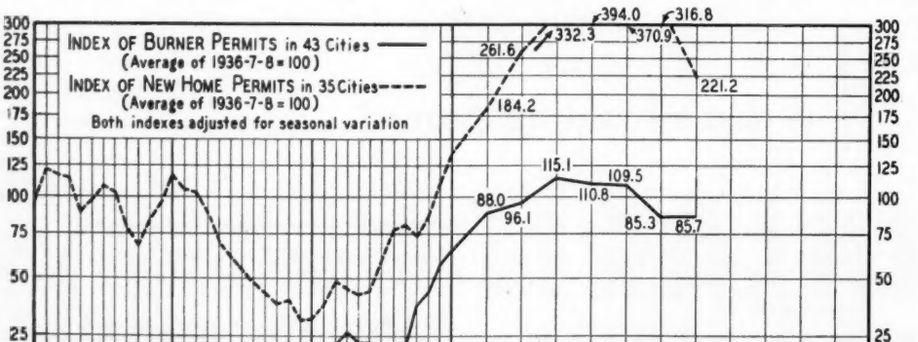
July Minimum Retail Prices: Key Dealers

	CONVERSION BURNERS		BOILER-BURNERS		FURNACE-BURNERS	
	Top price*	Low price	Top price*	Low price	Top price*	Low price
Highest	$487	...	$900	...	$895	...
Lowest	200	...	550	...	545	...
July Aver.	301	...	626	...	560	...
June Aver.	294	...	614	...	535	...

*Top price key dealers for conversion burners are those whose minimum retail prices are $200 or more, for boiler-burner and furnace-burner units (exclusive of ductwork) those whose minimums are $400 or over.

Price Index: Conversion Burners: January 1940 is 100%

WHOLESALE				RETAIL			
July	123.6	Six months ago	123.1	July	135.3	Six months ago	124.1
June	126.3	Year ago	111.8	June	132.3	Year ago	114.7



Oilheating Trends

INSTALLATIONS OF DOMESTIC oilburners and units in July are estimated at 38,187, substantially above the number installed in June. Total installations for the first seven months of the year were 202,861, considerably more than the industry ever before installed in that period of a year. With motor production importantly higher than a few months back it is reasonable to expect that factory production will permit installations to continue at a rate as high as in July.

New orders taken by dealers in July were approximately 26,432, considerably lower than installations made with a consequent reduction in the dealers' backlog of orders. Total orders taken in the seven months were 223,281, only about 10% above installations. The date of having to go out and sell burner business is certainly not far in the future.

BURNER STOCKS: Stocks of domestic oilburners and units in dealers' hands on July 31 were approximately 13,232, up about 1,500 from the previous month and nearly 5,000 higher than at the end of May. Clearly, installations are being made with less haste after receipt of the burners from the factories than was true a few months ago, partly due to shortage of installation materials, such as piping, and in some areas, oil tanks. Factory stocks on June 30, the latest available data, were 4,359.

SERVICE INCOME: Average income of service departments of reporting dealers for July was $2,389, up 28% from $1,868 reported by the identical dealers in July, 1945. Service income in June had averaged $2,086, and in May, $2,347.

OIL TANKS: Dealers in various parts of the country have been reporting increasing difficulty in getting oil tanks. This was probably to be expected when steel output during the third quarter was heavily indexed for veterans' housing and agricultural implement uses. Tank manufacturers as a result have been getting very little sheet stock and warning dealers of a coming shortage. Not too much can be done to speed up tank production, except where the shortage may interfere with completing new home jobs. If many new home completions are held back, through lack of oil tanks, it will be possible to get a priority setup to expedite these. Steel mills are not back to nearly

100% of capacity, so the chances are that the tank stringency will be eased before the end of the third quarter.

It was interesting to discover from the dealer reports this month that one reason for the tank shortage was that so many have been installed on jobs where the burners are not yet available. This is especially true in the Mid-Atlantic and the Pacific Northwest areas. The table shows that the real tank shortage as of about August 10 for the whole country was approximately 1,600, while nearly 24,000 tanks have been installed in homes where the burner is not yet on hand.

	INSTALLATION INCOMPLETE BECAUSE	
	Have Burners but No Tanks	*Tanks Installed but Waiting for Burners*
New England	319	1,117
Mid-Atlantic	0	13,736
Middle West	1,120	1,440
Pacific Northwest	0	5,016
Balance of Country	159	2,368
Total	1,598	23,677

Asked if they believed that on the jobs where they already have tanks installed they could definitely get the burner in by October 1, 47% of the dealers expect to be able to do this, and the other 53% do not.

There has been a great deal of conversation about dealers paying $30 to $40 for 275-gallon tanks. From the reports just received, it seems that about two-thirds of all tanks are being bought at ceiling prices and the remaining third at higher prices. There is a surprising difference on this point between various sections of the country, with New England experiencing almost no black market operation, as indicated in the following table.

	Per Cent of Tanks Bought at Ceiling Prices	*Per Cent of Tanks Bought Above Ceilings*
New England	98	2
Mid-Atlantic	49	51
Middle West	70	30
Pacific Northwest	76	24
Approx. Average	68	32

SUMMER FILL-UPS: Fueloil distributors report that as of August 10 they had delivered a summer fill-up to 43% of their domestic fueloil customers. This compares to 41% on the same date last year, 35% in 1944, and 39% in 1943. The number of fill-ups this year is so little above that of last year and the other rationed years, as to show that availability of coupons had little to do with it. Half of the reporting dealers say that they put forth more effort this year to get summer fill-up business, one-fourth of them made less effort, and the remaining fourth reports about the same effort.

GETTING NO. 5 OIL: Several reports have come from dealers indicating apprehension over future supplies of No. 5 oil. On the other hand, some refiners, particularly in the Midwest, are asking how they can go about getting more No. 5 business. The product is definitely more plentiful in the Midwest than on the East Coast, due principally to the larger percentage of catalytic cracking capacity in Districts I and III. Only 6% of the reporting fueloil distributors say they were unable to get all that they needed last winter, but 36% consider their outlook for No. 5 supplies next winter to be unsatisfactory. Asked whether if they now have an ample supply, 73% do and 27% do not. The obvious answer to the No. 5 oil problem is a somewhat higher price in relation to No. 2, because the modern cracking plants can convert No. 5 to No. 2 with only moderate loss in gallonage.

Oilburner* and Building Permits

	OILBURNERS				DWELLINGS			
	July		7 MONTHS		*July*		7 MONTHS	
	1946	*1945*	*1946*	*1945*	*1946*	*1945*	*1946*	*1945*
Baltimore, Maryland	514	..	..	..	..	..	..	..
Binghamton, New York	..	..	..	..	18	11	72	13
Boston, Massachusetts	268	68	..	408	..	..	..	..
Bridgeport, Conn.	98	24	384	104	..	..	..	..
Buffalo, New York	..	..	..	..	15	10	..	15
Des Moines, Iowa	..	..	..	..	126	11	..	21
Detroit, Michigan	..	..	..	..	607	214	5564	1469
Elizabeth, N. J.	84	6	339	27	0	1	9	1
Freeport, New York	45	2	219	29	..	..	..	..
Greenwich, Conn.	..	..	..	..	21	5	130	6
Hackensack, N. J.	..	..	..	..	2	16	..	60
Hartford, Conn.	102	89	..	157	..	..	..	..
Irvington, N. J.	48	1	295	20	5	2	13	2
Lynn, Massachusetts	..	..	..	..	4	0	34	2
Meriden, Conn.	8	..	..	..	..	..	..	..
Milwaukee, Wisc.	87	1	531	29	99	121	1061	..
Minneapolis, Minn.	56	9	320	93	96	72	909	320
Montclair, N. J.	40	5	..	18	..	..	..	..
Morristown, N. J.	..	..	..	..	3	0	..	1
Mt. Vernon, New York	66	4	286	64	..	..	..	..
Newark, New Jersey	286	..	..	..	..	..	..	..
New Bedford, Mass.	44	9	303	166	..	..	..	..
New Haven, Conn.	47	4	235	24	..	..	..	..
New Rochelle, N. Y.	30	0	162	71	16	0	82	0
Norfolk, Virginia	37	4	221	..	28	7	147	29
Oakland, Calif.	0	0	2	2	..	..	..	..
Omaha, Nebraska	96	13	503	59	63	28	524	153
Orange, New Jersey	38	1	..	9	0	0	4	0
Passaic, New Jersey	60	..	268	..	..	..	..	..
Paterson, N. J.	87	1	518	43	2	0	31	1
Philadelphia, Pa.	701	..	3330	..	..	..	..	..
Plainfield, N. J.	..	..	..	..	7	0	67	5
Portland, Maine	36	5	220	45	12	0	73	1
Portland, Oregon	..	..	..	..	160	59	..	293
Providence, R. I.	102	6	559	54	5	2	40	6
Reading, Penna.	..	..	..	..	20	3	78	10
Richmond, Virginia	55	1	257	5	37	44	..	366
Rochester, N. Y.	24	0	300	8	..	..	..	..
Rockville Center, N. Y.	31	2	141	26	12	0	54	0
Salem, Massachusetts	21	0	88	14	0	0	9	0
St. Louis, Missouri	50	4	353	56	18	0	195	0
St. Paul, Minnesota	105	11	725	72	93	35	792	252
Seattle, Washington	..	..	..	..	2.0	1.5	1660	560
Springfield, Mass.	..	..	..	..	70	50	401	66
Stamford, Conn.	36	5	175	32	..	..	..	..
Syracuse, New York	27	..	162	..	14	20	110	75
Trenton, New Jersey	..	..	..	..	2	0	5	3
Utica, New York	..	..	..	..	3	0	..	3
Washington, D. C.	313	8	961	135	..	..	..	..
West Orange, N. J.	..	..	..	..	10	1	77	4
White Plains, N. Y.	22	6	153	43	0	1	18	2
Wilmington, Delaware	73	6	366	18	35	0	167	0
Totals	2141	294	8395	1239	1839	848	11271	3260
Percent Change	+628.2		+577.6		+104.7		+245.7	

*Permits are not total sales in each market since none are reported from suburban areas, which normally account for 20% to 60% of total sales in each market; nor are they an accurate index where enforcement is lax. Rightly used, however, they are a useful working index.

Ol' Boy "X"

A
NEW
"X"
THE AMAZING
X
LIQUID
REPAIRS
LEAKS
STEAM-HOT WATER
SYSTEMS
HIGH & LOW
PRESSURE BOILERS
X
POWDER
DEHYDRATED
X LIQUID
REPAIRS
LEAKS

Service an Aid to Sales

The Right Service Plan Can Be Fruitful Source of Burner Orders

by
Dexter W. Goldthorp*

THE SEARCHING DISCUSSIONS on burner service which have taken place recently in meetings of this industry and in the columns of this magazine show that the industry is giving careful thought to what is sure to be one of its more serious problems in the years ahead.

The discussions indicate a general recognition of what should be done to improve the servicing of burners. The quality of service has been spotty: good where leading dealers have tried to make it so; poor where they have treated it as a sideline to the main business of selling burners or fuel oil. The great number of plans under which service is offered to the public is not good. Their variety leaves the impression that the industry has not yet found the right plans, even after 25 years. And the great difference in the prices charged for service must cause unfavorable reactions in the minds of many customers.

One reason for this non-uniformity in service [plans, charges, and quality], is the failure of many dealers to give burner servicing its rightful standing in their organizations. Servicing is not a tight little business of its own, to be organized and managed as such, praised or condemned by the color of the ink on the annual profit and loss statement. Rather, service is the logical continuation of burner selling, for it alone gives the customer the satisfactory heating over a period of years to which he becomes entitled upon signing an installation contract, and satisfied owners are the industry's richest source of good leads for new burner sales.

If every dealer would manage his service department as though it were primarily the long arm of his oil burner sales staff, there would be less confusion in his own mind about the service plan that is best for him and how much to charge for it. That plan is best which provides customers with uninterrupted heating. That plan is best which carries a dealer through a complete heating season with no emergency calls from customers because of mechanical breakdowns. This may seem like shooting at the moon, but if it does to you, then how do you account for the well-known fact that thousands of burners operate each season without breaking down? Old ones too. The goal is not too high. It is well within the area of possibility. But it will be reached only by those dealers who see that service really is a part of *selling* oil heating, not a part of a plumbing and heating business.

Service Overhead to Sales

Dealers who give service its correct place in their organizations are likely to place a fair value on service work. Their service efforts are directed toward satisfying customers,i.e., quality work at a fair price. Where such dealers dominate a market, the range in service charges is not wide; all users of burners get equal treatment. And since service is treated as a part of selling, the dealers have clear justification for asking their burner and heating equipment sales departments to contribute somewhat to service overhead, if necessary, to hold service charges to customers at a reasonable limit. Contributions take the form of commissions on sales made as the result of leaders obtained from satisfied customers, or on sales of accessories or heating equipment sold to present customers by the cooperation of the service department.

Still, in the final analysis, no service plan, no method of charging is of any lasting value to a dealer or to the industry if the quality of service is low. Raising it is still the first item on the agenda. Naturally, any discussion of service quality eventually gets around to the manpower problem—the question of getting enough trained men. Much is being done along this line, both by manufacturers and dealers and by the industry cooperatively. Again, the need for getting good men, and then training them assumes greater importance to those who associate service with selling than to those who do not, which is another argument for giving service its correct place on the organization chart.

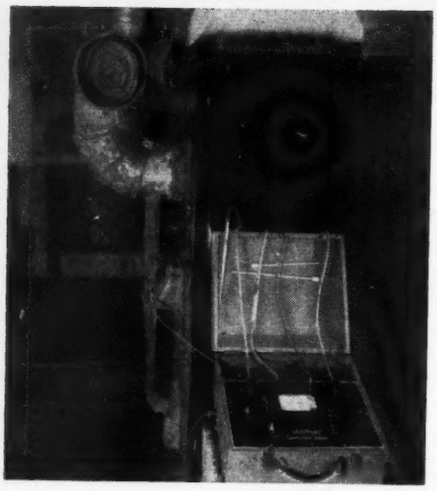
Time Element in Manpower

But there is another way to approach the manpower problem. The difficulty with training is the broad scope of the subject matter that must be covered. The ideal service man is experienced in heating engineering, plumbing, combustion, and electricity. It takes a lot of teaching and hours of hard study to turn out a finished man, and there aren't enough teachers or men willing to make the effort. Add to this the fact that most courses in service graduate men in a matter of weeks, and the limitations of the usual training technique become obvious.

The other approach is to reduce the skill and experience required for servicing burners. New burners that go far in this direction are being and will be designed. It may be possible in time for a screwdriver artist to remove a burner that doesn't operate up to standard, replace it with a good one and deliver the troublesome one to a repair expert. Such developments will help. Yet it is safe to assume that there will always be a need for men who know how to make a particular burner operate at maximum efficiency in a particular heating system—and who can do it without wasting expensive time experimenting, going back again and again. Anything that would help such a man do expert work with no more training than he is getting today—or with less—would be of great value.

One project now in the final stages of

*Socony-Vacuum Oil Co., Inc., New York.



Combustion *testing instrument developed for Socony-Vacuum. Operated by plugging into house electric current, the device measures CO_2, stack temperature, draft and smoke density.*

development will, when finished, make it unnecessary for a service man to be skillful at handling combustion testing instruments. This is a step in the right direction. The project is a joint one between Socony-Vacuum's Mobilheat Research Laboratory and an instrument manufacturer. These two have designed an oil burner test kit, enough units of which have now been made and tried out to prove that the principles employed are correct—that it is possible to make a light-weight, compact unit which is capable of withstanding hard use without losing accuracy, and which can be operated by anybody who knows how to connect the unit to a smoke-pipe. As in any new device, the trial units disclosed opportunities for improvement and these are now being made.

This test kit operates when plugged in on house current. It has a needle that moves over three scales—per cent CO_2, draft and stack temperature. It also has a device for drawing flue gases through a paper filter for determining when smoke density is satisfactory or excessive. A pump in the unit draws the flue gas samples needed for measuring smoke or per cent CO_2. Once the unit is set up for operation—a matter of minutes—the values for CO_2, draft, and temperature can be read on the scales, one after the other, by turning appropriate knobs. The smoke test must be conducted separately, but it takes only $3\frac{1}{2}$ minutes. No special skill is required to get reproducible results the first time.

Developments like this enable the industry to raise the quality of service at once, without waiting for training programs to take effect. Other new things will come along, too, equally as helpful, for it's a matter only of designing burners, tools, and instruments that make it easy for a qualified service man to diagnose trouble and to keep burners operating all the time at the efficiencies of which they are eminently capable.

As such equipment becomes available, this industry will be in as favorable a position as any of its competitors for maintaining the operating efficiency of the burners it has installed. Naturally it will be necessary to tell the public about this —as quickly as it is possible to do so—because we know from recent surveys that more than a few people consider gas a more efficient, a more dependable, and a cleaner way of heating than oil. Their opinions reflect, more than anything else, the experiences of persons whose oil burners were improperly serviced, not those whose burners were maintained in good condition. It is imperative for sales reasons that these erroneous opinions be corrected, further proof that service is not a thing apart from selling.

The first step in a campaign designed to sell the quality of burner service would be to show burner users that the oilheating industry has made progress in its efforts to maintain its installations expertly. We can't do that today, generally, because we could show the user only the same service man with the same tools the user has seen for years. Good as this man may be in any particular case, nevertheless he alone cannot be presented as a symbol of progress. But give that service man a test kit like that described earlier, or any device that helps him do his work with greater scientific accuracy, and you have a convincing argument that the quality of service work has advanced. Then to this add the use of men who are adequately trained, a sensible plan for maintaining burners in efficient operating order, priced fairly, and some testimonials about quality of service from satisfied users, and you have the elements required to sell service in advertising and in direct presentations—to convince doubtful prospects for new burners that an installation contract is assurance not only of the equipment for automatic heating but of its satisfactory operation at reasonable cost all through the years.

Control for Radiant Heating

An Engineering Report After Discussion With Pipe Mfrs.

By
J. A. Cutler*

BY FAR THE LARGEST number of radiant heating systems have employed pipe or tubing coils imbedded in the building structure, through which hot water is circulated. While steam coils have been used in some cases, steam as the heating medium is not generally as practical as water, because the higher temperatures greatly multiply the problems due to expansion and contraction of the materials involved. The coils may be located in floors, ceilings, or walls, and in some cases more than one location is selected.

A limiting factor, in the use of floor coils, is the maximum temperature permissible without making the floor feel uncomfortably warm. The "Guide," published by the American Society of Heating and Ventilating Engineers, gives a figure of 90° as the maximum temperature of floor coils. If calculations show that a 90° floor temperature will not provide sufficient heat, then one of several alternatives must be adopted.

1. Sometimes, the borders of the radiant surfaces in the floor, and other areas, not subjected to prolonged use, such as entryways, corridors, etc., are piped separately and carried at a higher temperature than the rest of the zone, to increase the over-all heat output of the floor area.

2. Supplementary surfaces may be installed in walls or ceiling to make up the deficiency in the heat output of the surfaces in the floor.

3. If forced ventilation is used in conjunction with radiant heating, the temperature of the air supplied is sometimes made high enough to carry part of the heating load at low outside temperatures.

A novel system of radiant heating with floor surfaces has been devised by at least one architect. The system has been applied almost exclusively to one-story residences, without basement, and uses hot air as the heating medium. The floors are constructed of about 12″ x 12″ x 6″ hollow tile, which also serve as air ducts. Since the maximum heat output obtained from the floor is limited, and since this system does not lend itself readily to the use of wall or ceiling surfaces, the maximum heat output obtainable from the floor surface is first computed, then the building structure is designed in such a way that the heat loss will not exceed that figure.

Ceiling surfaces may be carried at considerably higher temperatures than those in the floor and, therefore, seldom have to be supplemented by additional surfaces in walls or floors. Generally, the ceiling structure is less massive than a floor structure, with a consequent smaller heat storage capacity, and there is less time-lag between a change in the heat input to the coil and the heat output from the surface. Lack of rugs, and other covering, commonly found on floor surfaces, also aids in this direction. Ceiling surfaces are not often used where extremely high ceilings exist.

Wall coils are most commonly used to offset the low radiant temperature existing near window areas, or to supplement floor coils, and sometimes to augment the heating effect of ceiling coils.

Offset Window Temperatures

Other methods of offsetting the low radiant temperature of window areas or outside walls are often used. One common arrangement is to lay the coils, either ceiling or floor, so that the hot water inlet is at the point nearest the outside wall, and the return connection is at the point farthest from the outside wall. With this arrangement, the temperature of the radiant surface becomes progressively cooler as the distance from the outside wall increases. Another method is to provide a separate narrow zone adjacent to the outside walls, where the radiant heating temperature is kept at a higher value than for the inside zones.

From all evidence, it appears that the greatest single consideration in the control of radiant heating is the inherent thermal inertia of the system. It is obvious that a massive concrete slab, in which hot water pipes are imbedded, is not going to start emitting heat the minute hot water is supplied to the coils, nor is it going to stop emitting heat as soon as the water is shut off, or its temperature lowered. This thermal inertia is considerable, even in the case of ceiling or wall coils which may be covered only by a layer of plaster.

Different Thermostat Effect

A room thermostat, as the primary means of control, generally will cause considerable cycling of the space temperature, whether it controls the quantity or temperature of the water supplied to the panel. On a rising space temperature, the thermostat reduces the heat input to the coils. However, the radiant surface continues to emit an excessive amount of heat for some time, during which the space temperature rises above the setting of the thermostat. This causes the thermostat to further reduce the heat input to the coils. Eventually, the space temperature will cool down to the point where the thermostat again increases the heat input to the coils. Because the radiant surface previously has been cooled too much, its heat output will not meet the requirements of the space for some time, and the space temperature continues to drop. This results in a further heat input to the coils, the space temperature eventually begins to rise, and the cycle is repeated. The above analysis applies, whether the thermostat in question responds to changes in air temperature, to radiant temperature, or to a combination of both, and shows that, by controlling from space conditions, the thermal inertia, or storage effect, of the radiant surface operates contrary to the requirements of satisfactory control results.

Because of the inherent thermal inertia in the radiant surface and the action described above, it is apparent that the need for a change in the temperature of the radiant surface must be measured before it is reflected by a change in space conditions, if these space conditions are to be held substantially constant. In most cases, the internal load is relatively constant, and the need for a change in surface tem-

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perature arises immediately upon a change in outdoor temperature. Therefore, for the primary control of a radiant heating system, an arrangement which varies the surface temperature according to changes in outdoor temperature, is necessary. The above reasoning leads to the conclusion that a Johnson Duo-Stat offers the best possibility of effecting superior control of a radiant heating installation.

An analysis of the functioning of a radiant heating system under Duo-Stat control may serve to indicate further the advantages of this method. Assume that a drop in outdoor temperature occurs. The Duo-Stat immediately increases the heat input to the coils. However, due to the previously mentioned thermal inertia of the system, a certain amount of time elapses before this manifests itself by an increase in the temperature of the radiant surface. On the other hand, the drop in outdoor temperature does not immediately effect a change in the heating load on the system because of the time required to transmit this change through the building structure. Therefore, with the Duo-Stat method of control, the thermal inertia of the radiant surface not only ceases to be a hindrance to good results, but definitely improves results because it is not desirable to change the heat output of the surface until the change in outdoor temperature becomes effective indoors. The ideal situation would be one in which the thermal inertia of the surface is equal to the thermal inertia of the building structure. Regardless of how seldom this ideal situation may occur, it is a fact that the thermal inertia of the surface is in the right direction with this method of control and is no longer a hindrance as it is when controlling from the space conditions.

Below are outlined the recommended methods of primary control for radiant heating, keeping in mind that installations vary considerably in many details. The descriptions, therefore, will be general rather than specific.

1. An example of a simple application of a Duo-Stat to radiant heating is the operation of a valve in the steam supply to a hot water converter. This, of course, can apply only where the converter serves one zone.

2. When a radiant surface is heated from a cold condition, *i. e.*, when the system is first operated, or after a prolonged shutdown, the coils and the material immediately surrounding the coils become warm much sooner than the rest of the radiant surface. This causes a differential expansion which, in time, may injure the material which comprises the surface. Some engineers, therefore, have insisted on gradually increasing the maximum water temperature, over a period of several days. To accomplish this, an immersian thermostat should be installed in series with the Duo-Stat described in "1," above, with its bulb in the converter discharge. If both are reverse acting, operating a normally closed valve, the immersion thermostat acts as high limit and can be adjusted as desired. If it is undesirable to use a normally closed valve, the same results may be accomplished with direct acting controllers, allowing the immersion thermostat to function through a 3-way air valve.

Either Method 1 or 2 may be used also in connection with the control of an automatic hot water boiler, instead of a converter. The Duo-Stat would be used to directly control a stoker, oil burner, or gas burner.

3. A slightly more elaborate arrangement is to control a valve in the steam supply to a converter by means of an immersion thermostat only, set for a temperature equal to the highest requirement. The Duo-Stat, then, operates a 3-way valve to control the water temperature to the zone. This arrangement is applicable where the converter serves any number of zones. The immersion thermostat still can serve as a means of gradually bringing the radiant surface up to temperature, as outlined in Method 2. The advantage of Method 3 is that the use of mixing valves as the final control insures less variation in the zone water temperature than occurs when the control is arranged as described for Method 1.

HOW TO CONTROL Radiant Heating
Valve controls the flow of hot water to heating coil in radiant surface for each separately controlled space.
Room Thermostat operates flow Control Valve to maintain exactly the desired space temperature.
Duo-Stat operates Mixing Valve to maintain the proper relationship between the temperature of the hot water supplied to the heating system and the outdoor temperature.
Mixing Valve controls the temperature of the water supplied to the heating system by mixing hot water from the boiler with cooler return water.

4. Method 3 makes use of an immersion thermostat to control the hot water temperature supplied to the zone mixing valves. This temperature is the highest which will be needed under severe weather conditions. Under mild weather conditions, the Duo-Stats are required to mix a small amount of very hot water with a larger quantity of cool return water, to produce the required zone water temperature. A more uniform water temperature would result if the hot water from the

converter could be always about fifteen or twenty degrees above the required zone water temperature. This suggests the use of another Duo-Stat in place of the immersion thermostat in the hot water line from the converter. This Duo-Stat would have its outdoor bulb on the coldest exposure and a ratio equal to the highest ratio used on any of the zones.

5. In any of the primary control methods suggested, it might be desirable to arrange the controls so that the zone circulating pump is stopped whenever there is no longer a demand for heat. Thus, a pressure-electric switch would be installed so that the branch pressure from the zone Duo-Stat would stop the pump after it has closed the valve to hot water.

In order to obtain closer control of the space temperature than is possible with primary control alone, room thermostats should be used, to limit or modify the action of the primary controls.

1. As a limiting device, a room thermostat is installed in the zone, connected in series with the primary control, and if both the Duo-Stat and the room thermostat are reverse acting, the room thermostat functions as a high limit, cutting off the supply of heat to the coils whenever the space temperature exceeds its setting.

2. As a modifying device, a room thermostat, in the zone, is used as a pilot to readjust the primary control. Thus, with Duo-Stat primary control, the Duo-Stat is of the sub-master type, and the room thermostat serves to modify the setting of the Duo-Stat, in accordance with changes in room temperature.

3. Further refinement in space control can be accomplished by eliminating the zone thermostats mentioned in Method 2 and installing thermostats in each room. These thermostats would operate throttling or 3-way valves in the supply lines to the panels in their respective rooms.

Radiant Control Similar

The purpose of the above outline of various control arrangements is to show that the control of radiant heating system differs little from conventional methods used on installations involving direct radiators or convectors. Room thermostats can and should be used wherever the most accurate results are desired, provided that they are used in conjunction with a suitable primary control system based on varying the water temperature in accordance with the outdoor temperature.

There has been some agitation from a number of quarters for a space thermostat which will respond to the mean radiant temperature in a space, or to a combination of mean radiant temperature and air temperature. In fact, the A. S. H. & V. E. "Guide" even goes so far as to describe such an instrument and suggests it as a means for controlling radiant heating systems. This type of instrument would have the same drawback as an ordinary room thermostat used as the primary control instrument.

Less Body Heat Loss

Going back to the theory of radiant heating, the two variables affecting the heat loss from the human body, insofar as this discussion is concerned, are radiation and convection. Where a radiant heating system is employed, less body heat is lost by radiation than with a conventional heating system, because of the higher mean radiant temperature of the surrounding surfaces. However, more heat is lost by convection, because of the lower air temperatures. In any event, the body loses heat by both means. Since there is a definite relationship between the mean radiant temperatures and the air temperature in a given space (where forced ventilation is not used), an ordinary room thermostat can be used if a limiting or modifying device is desired.

Most advocates of radiant heating point out that lower room temperatures are permissible than are possible with conventional heating systems, without going to the trouble of explaining how these lower room temperatures are produced. The fact is, with a normally "tight" building, heated by radiant surfaces, that the air temperature will tend to rise until, finally, it is practically at the same value that would be maintained in convection heating systems.

In order to maintain room air temperatures that are much below the mean radiant temperature of the surrounding surfaces, some form of forced ventilation is required. Control of the forced ventilation system need be no different than when used with direct radiation; that is, a fan discharge thermostat regulates the temperature of the air delivered to the space at a level equal to, or slightly below, the desired space temperature. The use of forced ventilation should not alter the basic control system for the radiant heating plant.

The ventilation system is sometimes designed to carry part of the heating load, just as is done with direct radiation. This arrangement is more often used to supplement radiant heating surfaces located in floors. Control of the temperature of the air delivered would be by one of the following methods:

1. A sub-master fan discharge thermostat reset by an outdoor master thermostat. If Supplementary heating is needed only during periods of lowest outdoor temperatures, the master thermostat would be adjusted to operate only over this range. Assume a design temperature of minus 10 degrees, and a radiant system that can carry the heating load unaided, at outdoor temperatures of plus 20° and higher. Then the master thermostat would be set to produce full resetting effect from plus 20° to minus 10°. At all other times the fan discharge thermostat would control at its base setting.

2. The fan discharge controlled as above, with a room thermostat acting as the master to the fan discharge thermostat.

3. The fan discharge controlled by a room thermostat directly, in conjunction with a low limit, fan discharge thermostat.

In either of the last two methods, the fan system supplements the radiant heating system whenever the space temperature drops below the room thermostat setting.

Two Company Recommendations

To complete the part of this discussion dealing with methods of control, attention is called to the methods recommended by two companies which have done considerable experimental work in radiant heating:

1. In the A. M. Byers Co. bulletin "Byers Wrought Iron for Radiant Heating" page 41, in the paragraph headed "How May a Radiant Heating System be Controlled," it is pointed out that the air temperature cannot be either much below or much above the mean radiant temperature. That being the case, it is apparent that a thermostat measuring the temperature of the air in the room will provide as much control as can be accomplished by an elaborate so-called "Radiant" thermostat. This same section also mentions the advantage of "anticipating" the need for

a change in heat input to the radiant surface by regulating from outdoor, rather than room, temperature.

2. The "Chase Radiant Heating Manual," just published by the Chase Brass and Copper Company, has the following to say about control of radiant heating systems: "While any thermostatic method of control will function with a radiant heating system, the most desirable method is that based on continuous circulating hot water. The temperature of the water should be automatically adjusted to meet outdoor conditions, but the circulation itself controlled by interior 'limiting' thermostats rather than the simpler 'off and on' method of circulating hot water at a fixed temperature."

While some installations have been made with the Duo-Stat control bulb imbedded in the radiant surface, with good results, it is believed that fully as satisfactory results are obtained when the control bulb measures the temperature of the supply water. This should also make a more simple installation. The control bulb may be strapped to the outside of, or inserted into, the supply pipe. For steam-heated surfaces, the control bulb should be inserted in the panel structure. When the Duo-Stat bulb is thus inserted, the usual practice is to bury a straight section of pipe in the panel, with the open end left accessible, so that the bulb may be slipped into it to the proper distance. Some provision should be made to remove the bulb without placing an undue strain on the capillary tubing, and this can be accomplished by attaching a piece of wire to the bulb to permit it to be withdrawn.

Although most of the radiant heating installations on which data are available make use of proportional operating controllers, the very nature of this type of heating system would lead us to expect fair results from two-position operation, if other considerations indicate that such control is desirable. The large storage capacity of the surface tends to even out its rate of heat emission, in spite of the fact that the heat may be supplied in cycles. Of course, the shorter and more frequent the cycles, the more uniform the output of the surface, and therefore, better results should be expected with two-position operation if the control bulb measures the supply water temperature than if it measures the temperature of the radiant surface. On the other hand, two-position operation should not be used if the control bulb measures the temperature of the water, and the controller operates a mixing valve, because extremely short cycles will result. In this case, the control bulb should be located in the surface, or in the return line from the surface. Generally speaking, there will be very few cases where two-position operation is necessary, and it is recommended that proportional operation be employed whenever possible.

The ratio between the change in the controlled temperature and the change in outdoor temperature is figured in the same manner as for a direct radiator system, and is stated mathematically as follows:

$$\text{Ratio} = \frac{\text{Maximum Controlled Temperature minus Minimum Controlled Temperature}}{\text{Maximum Outdoor Temperature minus Minimum Outdoor Temperature}}$$

Assume a radiant heating system with coils in the floor, designed to heat a building at a minimum outdoor temperature of zero degrees, with a maximum radiant surface temperature of 90 degrees. Assume, further, that at outdoor temperatures above 60 degrees, no further input of heat is required. The heating surface then will be at the normal room temperature of 70 degrees. The control bulb is buried in the panel.

The ratio then is $\frac{90\text{-}70}{60\text{-}0} = \frac{20}{60} = \frac{1}{3}$

Now assume the same conditions, with the control bulb measuring the temperature of the water. In this case, the water temperature which the designer has figured, to produce the radiant surface temperatures noted above, must be known. Assume that the water temperature limits are:

For a 70° surface—Water temp. = 90°
For a 90° surface—Water temp. = 120°

In this case the Ratio is $\frac{120\text{-}90}{60\text{-}0} = \frac{30}{60} = \frac{1}{2}$

In the first example, a 3:1 Duo-Stat is used. In the second case, a 2:1 ratio Duo-Stat is used. In like manner, the exact ratio for any radiant heating job may be computed from the design data, and a Duo-Stat of the nearest obtainable ratio.

Army Wants Oil In Big Inch Lines

SALE OR LEASE of the "Big Inch" pipelines, though not yet settled, may yet be for carrying oil instead of gas as freely predicted by newspapers and many insiders. There has been strong indications that the offers to buy or lease the lines for the transportation of natural gas might be accepted, but it is known that the Army is opposed to converting the lines from petroleum transport, since these are the only hedge the country has against another interruption of tanker transportation to the eastern seaboard.

Patriotic considerations and the possible urgent need for these facilities in times of emergency are very strong, but there is another consideration in the sale of the pipelines frequently overlooked in the discussion. Sale of the lines transfers title to a wide right-of-way across the heart of the country, and constitutes one of the biggest real estate deals since the railroads were granted their rights-of-way across the country and alternate sections of land on each side of the track. Assembling and purchasing such a tract of land could be done only by the Federal Government, and probably only then in a time of emergency. Land owners are reluctant to sell slices out of their property, and only in times of stress would Congress be able to withstand the pressure that would be felt from home.

More Petroleum Than Oats

Army thinking, however, is less concerned with title to the land than with the ease with which the lines could be used in an emergency. The cavalry today uses much more petroleum than oats, and every other branch of the fighting forces becomes practically helpless without oil. In any emergency it would be essential that oil, both crude and products, be transported immediately and without the bother of putting the lines in condition. If the lines were converted completely to the transportation of gas, it is estimated it would take six months to reconvert them to carry oil. There are some who are willing to bet the next war will not last six months, and any such delay might be fatal. If the lines were kept in petroleum service, they could be used almost overnight if necessary. Therefore, the Army favors use of the lines for oil, and it is likely the Army will have its way.

Cooperative Dealer Promotion

Westchester Burner and Oil Men Launch Advertising Program

A NUMBER OF local oilheating dealer associations have talked about the need for joint advertising of oilheating's advantages. Few of them have yet taken the necessary steps to raise money and put such a plan into operation, and probably no other group throughout the country has instituted such a complete campaign as the one currently being run by the Westchester Oil Trade Assn., Inc., comprised of some 50 oilheating dealers in New York City's northern suburbs.

Tom Brown of Sentinel Oil, Mt. Vernon, is president of the group, H. M. Spade of Robison Oil, Hartsdale, is chairman of the publicity committee, and the program has been designed and supervised by S. Frederic Auerbach Co., New York advertising agency.

Unique in some of its approaches to the problem of stimulating oilheating interest in advance of the intensive selling days to come, the advertising project embraces some ten types of activities. These are:

1. Car card displays have been placed in the many commuting trains of the New York Central Railroad serving the greater Westchester County area.

2. Similar display cards are in numerous buses serving the local transportation needs within the County.

3. On the station platforms of the New York Central and the New York, New Haven and Hartford Railroads throughout the County are large framed posters.

4. Sixty large billboards are being used on a rotated basis, very effectively blanketing the county. Each month five boards carry the oilheating story, to get full coverage in a year's time.

5. Starting September 22 and running 13 weeks, a half-hour program is to be broadcast over station WFAS, White Plains, each Sunday at 3:30 P.M. The program, to be known as "Westchester Youth Speaks," will feature forum discussions in which students from various schools within the county will exchange views on subjects of topical interest.

Outstanding persons in Westchester County educational, civic and social affairs will act as guest moderators. These programs will be prepared and presented with the cooperation of the Westchester County Teachers Assn.

6. The three hundred oil delivery trucks operated by members of the fuel-oil group and which are seen daily by residents of every community in the County, will have painted on the tires in five-inch letters the slogan, "Oil Heat—The Best Heat." This novel means of advertising will be instituted on September 3 when the entire fleet of trucks will appear bearing the slogan for the first time.

7. In connection with the radio program, an essay contest will be conducted on the subject, "Contributions of Fueloil to Better Living." The contest is open to students of junior and senior high schools of Westchester County. A total of $900 in cash prizes, including a first prize of $300, will be awarded for the best essays. Mr. William Duke III, president of the Westchester County Teachers Assn. will be chairman of the committee of judges.

8. A series of display advertisements is appearing weekly in each of nine local daily newspapers in the County.

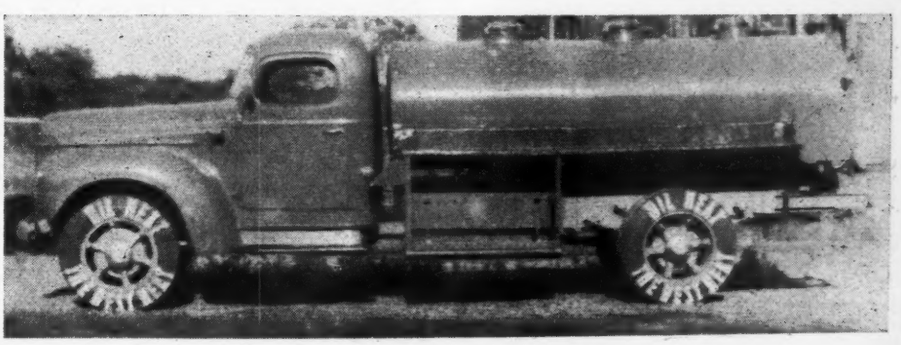
9. A distinctive symbol of the Westchester Oil Trade Assn., Inc., appears in all advertising copy, and a decal of the symbol has been made and is prominently displayed by all members at their places of business.

10. Publicity releases are sent to newspapers and magazines on the radio program, the essay contest and related matters.

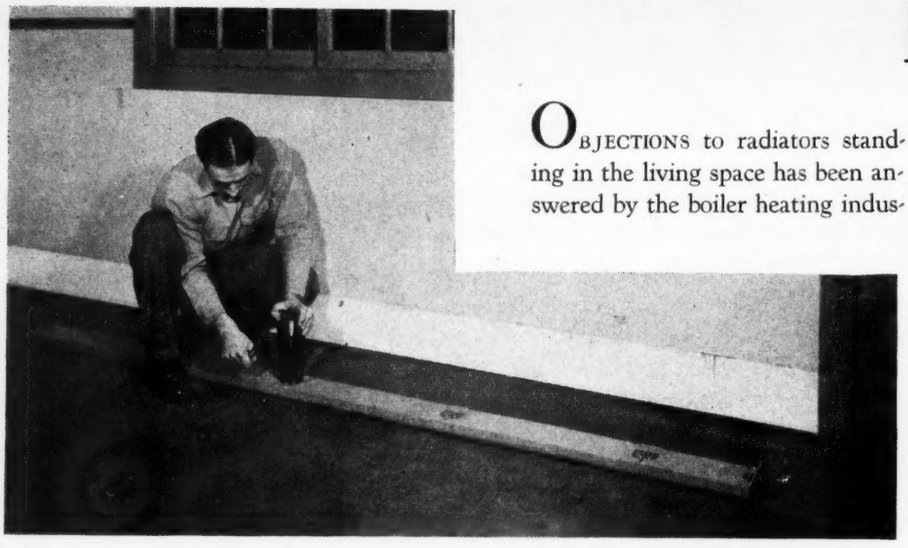
Westchester County is one of the two Eastern spots where gas competition is starting to make headway. So, while the oilheating dealers in the County have no more burners to install than dealers anywhere else, they are going ahead with the cooperative advertising now with the knowledge that it will put them in stronger competitive position next year when they expect burners to be plentiful.

Meanwhile, gas installations are also being held back through inability to get any considerable amount of equipment.

Typical *billboard or poster copy and message on truck tires.*



How to Install Ba



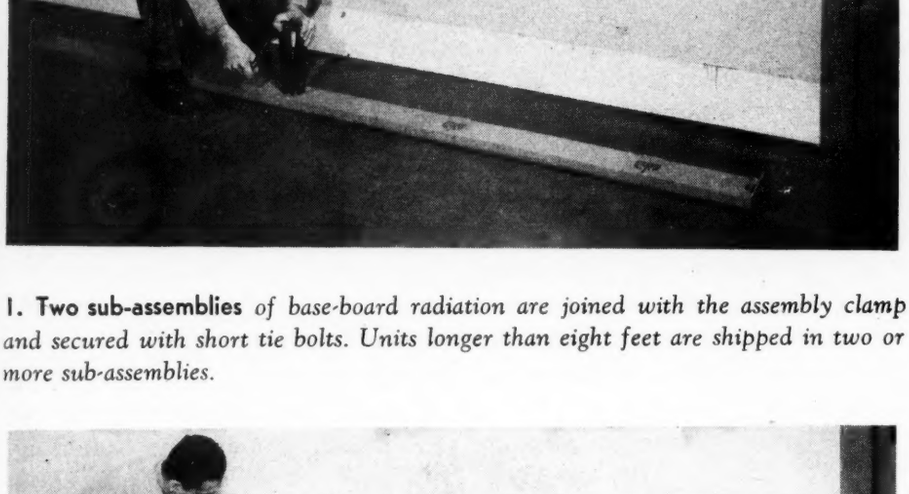
OBJECTIONS to radiators standing in the living space has been answered by the boiler heating industry with the baseboard radiator, which supplies "invisible heat" at the floor level. It is probable that this type of radiation will become popular in the better boiler heated homes and, to help dealers who will install them, Burnham Boiler Corporation has issued a series of seven photographs clearly showing the steps in an installation.

It is claimed that this type of radiation can be installed easily in existing homes as well as in new construction. The hollow cast iron sections are put together with push nipples to form a continuous strip of radiator at the foot of outside walls.

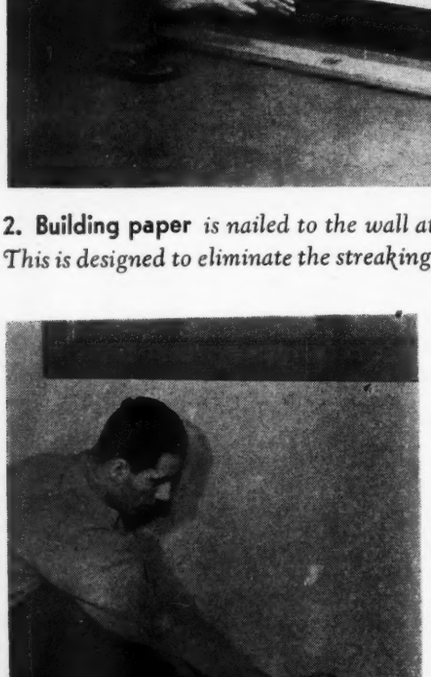
The amount of radiation in square feet which is installed in the base-board type of surface is the same as for conventional standing radiation.

In appearance, the panels are hollow, cast iron units seven inches high and 1¾ inches wide, and are supplied with hot water or steam from the usual heating boiler. They are approximately the same height, and slightly thicker than the conventional base-board, and are placed on one or more of the outside walls, usually extending the length of the wall.

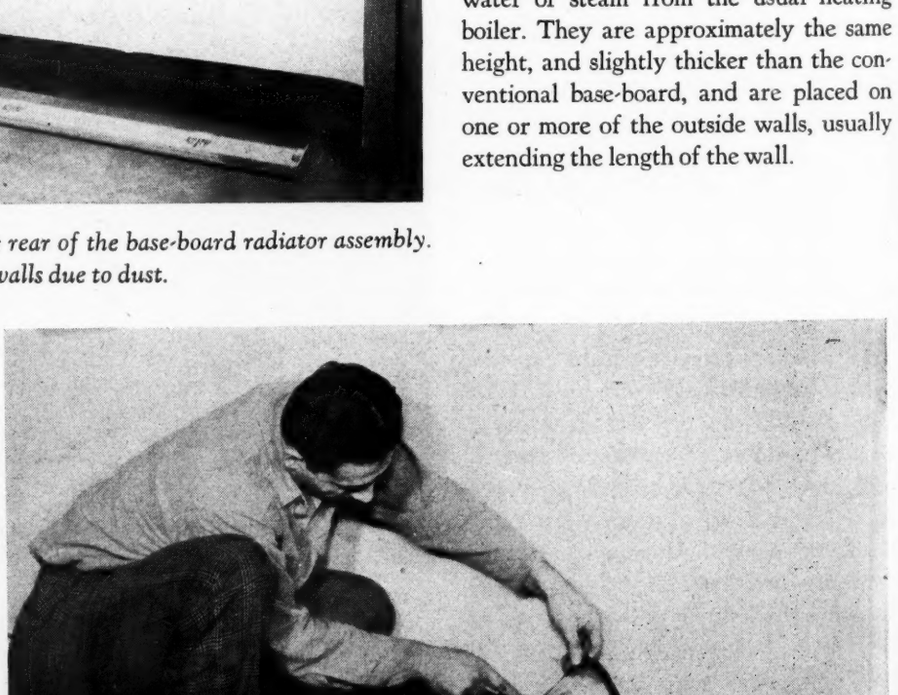
1. Two sub-assemblies *of base-board radiation are joined with the assembly clamp and secured with short tie bolts. Units longer than eight feet are shipped in two or more sub-assemblies.*



2. Building paper *is nailed to the wall at the rear of the base-board radiator assembly. This is designed to eliminate the streaking of walls due to dust.*



3. The panel in place, *the paper is lapped over the top and covered with ½-in. quarter round molding.*



4. Moldings are installed *at the top and bottom of the radiant base-board before the paper seal is trimmed, leaving a clean finish which can be painted to match the other trim in the room.*

Base-Board Radiators

Standard wood moldings at top and bottom of the panel give it the same finish as the other base-boards in the room. Painted to match the woodwork and trim in the room, the panels are hard to distinguish from the base-boards they replace.

This new type of radiation was developed under actual living conditions by research engineers at the University of Illinois, and has proved completely successful.

By spreading its warmth down in the coolest part of the room, at the bottom of the outside wall, the radiant base-board "provides the most even floor-to-ceiling home temperature ever achieved," according to an official report.

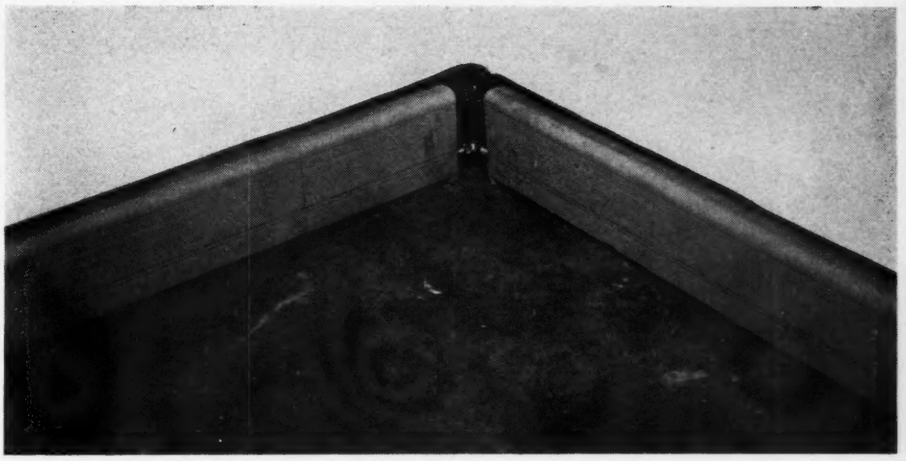
Tests were conducted in a six-room house built in 1940 by the Institute of Boiler and Radiator Manufacturers, and completely furnished and occupied. Even at sub-zero outside temperatures, researchers found no more than a 3° differential between the floor and ceiling, and temperatures remained uniform from the 5-foot to the 8-foot level.

As a heat source, the new base-board type of radiator is inconspicuous and does not interfere with window draperies or affect the arrangement of furniture. In addition, the new unit is easy to keep clean, since it offers the same compact cleaning surface as the other base-boards in the room.

Base-board radiation is easy to install and is relatively inexpensive, costing no more than conventional recessed cabinet radiation. Panels are manufactured in 24-inch and 12-inch lengths and are shipped assembled in units up to eight feet long.

Control valves are concealed by a neat metal enclosure which is flush with the front and top of the panels. Sections are joined by means of push-nipples and short tie bolts. Valves, ells and traps are connected to the base-board panels at the bottom opposite ends, as with tube type radiators.

This new type of radiation can be used on all types of hot water systems, either forced or gravity, one-pipe or two-pipe, as well as two-pipe steam and vapor installations. Installation steps are shown in the accompanying pictures.



5. Connecting base-board radiators *in series at the corner of the room is easily done by using a ¾ in. radiation union elbow.*

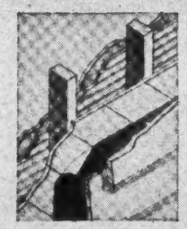
6. (Above) The connecting elbow *is concealed by a neat corner cover plate which watches the pattern of the radiator. Top and bottom wood moldings are in place.*

7. (Right) Valves and elbows *are concealed by a metal enclosure installed at the ends of the base-board panel assembly. The enclosure is equipped with an access door.*

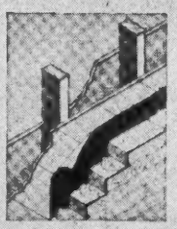
(Photographs are by the courtesy of the Burnham Boiler Corporation, manufacturer of Base-Ray radiant base-boards.)

REDUCTIONS IN FUEL BILL WITH USE

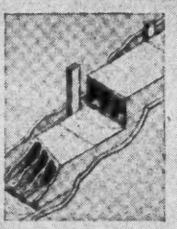
FOR TYPICAL ONE-STORY HOUSE



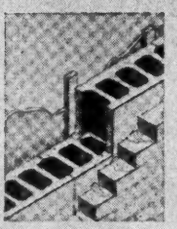
FRAME
Wood or Shingle Siding



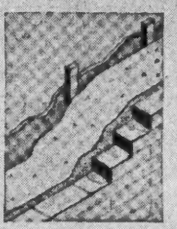
VENEER
Brick or Stucco on Frame



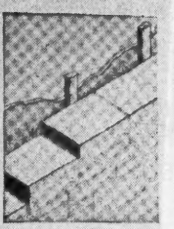
MASONRY
Stucco on Tile or Concrete Block



MASONRY
Brick and Concrete Block



MASONRY
Brick and Concrete



MASONRY
Stone 8"

Relative Fuel Bill of Home (without storm sash and insulation)	100	104	107	111	118	126
DESCRIPTION OF WEATHER-PROOFING	NUMBER OF FUEL UNITS SAVED BY WEATHER-PROOFING					
WINDOWS AND DOORS						
1. Weather stripping on all windows and doors	3	3	3	3	3	3
2. Storm sash and storm doors on all openings	12	12	12	12	12	12
3. Weather stripping plus storm sash and doors	12	12	12	12	12	12
CEILING INSULATION						
1. Insul. lath (1/2"). Attic not vented	9	9	9	9	9	9
2. Insul. lath (1"). Attic not vented	14	14	14	14	14	14
3. 1" insul. board over joist. Attic vented	12	12	12	12	12	12
4. 1" insul. board and 1/2" insul. lath vented	15	15	15	15	15	15
5. 2" blanket between joist. Attic vented	18	18	18	18	18	18
6. 4" blanket between joist. Attic vented	22	22	22	22	22	22
WALL INSULATION						
1. Insul. board lath (1/2") with plaster	5	7	9	11	16	21
2. Insul. lath (1/2") with insul. sheathing 25/32"	8	10	..	..	..	..
3. 1" blanket between stud or furring	9	12	15	18	25	31
4. 2" blanket between stud or furring	12	15	18	22	29	36
5. 3 5/8" blanket between stud or furring	13	16	20	24	31	39

DERIVATION AND USE OF THESE TABLES

Storm sash and insulation are usually applied only to rooms above the ground level. Hence, weather-proofing the house will reduce the heat-loss of these rooms, but will not affect the heat-loss from the basement. However, the fuel burned will heat the entire house including the basement. The savings of fuel units shown in these tables are based on heating the entire house and correspond more closely to test results than do tables based on calculations in which the basement heat-loss is neglected.

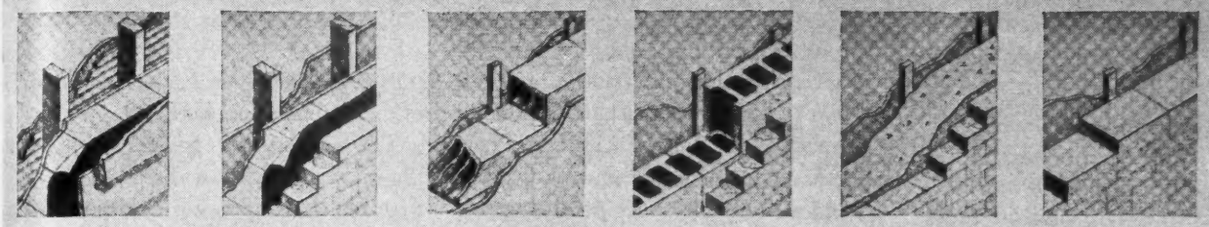
The houses used in the derivation of these tables were a one-story structure 36 ft. by 28 ft. and a two-story structure 28 ft. by 24 ft., each with a full basement. The ceiling height of all rooms was taken to be 8 ft., and the area of windows and doors was assumed to be 15% of the total exterior wall area.

These dimensions are average for typical one- and two-story houses. Reasonable changes from these dimensions, in the ratio of length to width or in the percentage of glass area, will not seriously affect the tabulated results. If a house is without a basement but uses a first-floor utility room, this table may still be used.

The figures across the top of the table give a comparison of the fuel bill for different constructions — all without insulation. For example, where 100 fuel units are used in a two-story frame house (column 1, page 7) the same house with brick-and-concrete-block exterior walls (column 4, page 7) would require 116 fuel units, or approximately a 16% larger fuel bill. The figures in any one vertical column give the reductions in the fuel bill to be expected by the addition of insulation. See the examples on page 7.

OF STORM SASH AND INSULATION

FOR TYPICAL TWO-STORY HOUSE



FRAME	VENEER	MASONRY	MASONRY	MASONRY	MASONRY
Wood or Shingle Siding	Brick or Stucco on Frame	Stucco on Tile or Concrete Block	Brick and Concrete Block	Brick and Concrete	Stone 8"

Relative Fuel Bill of Home (without storm sash and insulation)	100	105	111	116	127	138
DESCRIPTION OF WEATHER-PROOFING	**NUMBER OF FUEL UNITS SAVED BY WEATHER-PROOFING**					
WINDOWS AND DOORS						
1. Weather stripping on all windows and doors	5	5	5	5	5	5
2. Storm sash and storm doors on all openings	18	18	18	18	18	18
3. Weather stripping plus storm sash and doors	18	18	18	18	18	18
CEILING INSULATION						
1. Insul. lath (1/2"). Attic not vented	6	6	6	6	6	6
2. Insul. lath (1"). Attic not vented	8	8	8	8	8	8
3. 1" insul. board over joist. Attic vented	7	7	7	7	7	7
4. 1" insul. board and 1/2" insul. lath vented	9	9	9	9	9	9
5. 2" blanket between joist. Attic vented	11	11	11	11	11	11
6. 4" blanket between joist. Attic vented	13	13	13	13	13	13
WALL INSULATION						
1. Insul. board lath (1/2") with plaster	7	10	13	16	23	30
2. Insul. lath (1/2") with insul. sheathing 25/32"	12	16	..	..	..	..
3. 1" blanket between stud or furring	13	18	22	26	35	45
4. 2" blanket between stud or furring	18	23	28	32	43	53
5. 3 5/8" blanket between stud or furring	19	24	30	35	45	56

EXAMPLES OF THE USE OF THESE TABLES

A one-story house has a brick veneer exterior wall and neither insulation nor storm sash. What will be the reduction in fuel cost if storm sash and storm doors are added?

Locate the proper page and column for one-story brick veneer construction (page 6, column 2). The Relative Fuel Bill for such a house is 104 units per year. Read down the column to the figure opposite "Storm Sash and Storm Doors." This figure, 12, represents the savings from 104 units, or about 11% of the fuel bill.

In the same house (without storm sash or insulation), what savings can be expected from the use of both storm sash and 4-inch blanket ceiling insulation?

From page 6, col. 2, add the savings from Storm Sash, 12 units, to the 22 units saving shown opposite "4-inch blanket between joist." The 34 units total is the saving from 104 units, or about a third of the fuel bill.

A two-story house is to be built with 8"-stone exterior walls. The fuel bill has been estimated at $120 per year. What insulation must be added to reduce this to $60 per year?

The Basic Fuel Bill for such a house (page 7, col. 6) is 138 units. If this is reduced by one half, or 69 units, the desired savings will be reached. Add—Windows and Doors, Storm Sash: 18 units; Ceiling Insulation, 4"-blanket: 13 units; Wall Insulation, 1"-blanket: 45 units. Total: 18 + 13 + 45 = 76 units, which is satisfactory.

Similarly, other combinations of savings may be added, but in each combination you must limit your choice to only one Window-and-Door Weather-proofing, one Ceiling Insulation, and one Wall Insulation.

fueloil e oil heat

Which Kind of Efficiency?

According to Basis Used, Same Job is 58% or 87% Efficient

by
J. W. Schulz

The first article in this series appeared in the August issue. It included a stack loss chart but emphasized the limitations of such charts, pointing out that different charts and tables may give different answers because they are not of the same basis, and that charts and tables usually are based on complete combustion and continuous operation of the oil burner, but that on actual installations these premises often do not apply.

"OIL HEAT IS THE MOST economical automatic heat!" Certain sales experts advise the entire oil heating and fueloil industries to make one big, well-organized effort to publicize this idea. They insist that nothing better can be said in as few words, and that the popularity of oil heat has been built on the fact that every Tom, Dick and Harry can afford it. This idea reflects on the importance of keeping down the costs of oil heat.

Today, on-the-job engineering, and on-the-job installation and service efforts are largely responsible for the Smith's job using 2,000 gallons of oil yearly instead of 2,500 or 3,000. The oilheating industry is heading towards built-in high efficiencies for oil heating systems, but the goal is still a long way off. The dream is of package, plug-in oil-boilers and oil-furnaces. Placed in basements and quickly piped in and plugged in, they will operate at peak economy because they have been tuned for this at the factory. Today, however, on-the-job expert attention still is needed for maximum economy on typical installations. Weeding out the installation defects of a certain well-designed boiler-burner unit recently reduced its yearly oil consumption from 4,600 gallons to 2,900. The gallonage of a good furnace-burner unit was cut in half by (a) improving ducts and registers, (b) changing the speed of the circulating blower, (c) tuning the burner properly, and (d) re-locating and adjusting the room thermostat.

On-the-job efforts to reach maximum fuel economy relate, of course, to the efficiencies of actual installations. The numbers related to the efficiencies are important. A service engineer finds it good to tell a burner owner, "Your plant operated at 55% efficiency. My improvements raised the efficiency to 75%, therefore you will save 1,500 gallons of oil a year from now on."

Variety of Kinds

The question is: Which kind of efficiency is he talking about?

During the war a hard-headed burner owner, affected by government statements that every burner should be combustion tested, asked both his service man and his oil supplier to make tests. The service man said the efficiency was 58%, while the oil supplier reported it 87%. Determined to get facts, the owner had additional tests made by a combustion engineer. He announced 76% efficiency.

The owner heatedly ordered the three test experts to have a get-together in his basement. Here, all agreed on readings of 9% CO_2 and 650° stack temperature. They disagreed on the efficiency indicated by these readings.

The service man had worked at testing boilers in a laboratory. At 9% CO_2 and 650° stack temperature, he said, this boiler gave about 58% efficiency when fired intermittently. To prove this, he showed a collection of reports on evaporation tests; one showed that a similar boiler fired 15 minutes "on" and 60 minutes "off" operated at 60% efficiency with 8.8% CO_2 and 620° stack temperature.

Deducted Unavoidable Loss

The oil company expert found that 9% CO_2 and 650° stack temperature corresponded to 24% flue gas loss, but figured 11% loss as unavoidable because it comes of running 300° stack temperature and 13% CO_2, which he declared are perfect readings. Taking 11% from 24% gives an actual loss of 13%, he said, thus the burner was losing only 13% of the available heat in the oil and for all practical purposes was making good use of 87% of the available heat in the oil.

The combustion engineer agreed with the oil company man that 9% CO_2 and 650° stack temperature indicates a flue gas loss of 24% of the heat in the oil, but he deducted this from 100% and arrived at 76% efficiency.

After hearing these explanations, the burner owner suggested that the three oil heating experts get together and agree on their meaning of "efficiency." No matter how the numbers are explained, he declared, the same burner cannot be operating at efficiencies of 58%, 87%, and 76% at the same time.

A certain boiler manufacturer is puzzled about a letter he received from an enthusiastic burner dealer.

"Readings of 12½% CO_2 and 350° stack temperature show your boiler is running at practically 90% efficiency," the letter reads.

74% or 90%

The laboratory test report prepared by the boiler manufacturer shows a peak efficiency for the same boiler of 74%, and he declares that this was attained with difficulty and under favorable conditions which cannot be duplicated on actual installations. He believes that the 2.0 gph nozzle the dealer is using must be firing about 1.3 gph, as this would account for the low stack temperature reported. Besides, he says that he doubts if the equipment dealer knows the meaning of the word efficiency.

The meaning of "efficiency" starts with the meaning of the heating value, or Btu per gallon or pound, of fuel oil. These values are typical of those commonly used:

CS Grade Fuel Oil	*Btu per Gallon*
No. 1	133,500 to 137,000
No. 2	137,000 to 140,000
No. 3	140,000 to 143,000
No. 5	145,500 to 149,500
No. 6	149,500 to 153,500

Such values are the higher heat values for fuel oil, used as standard in this country. Other values, termed "lower," "net," or "available" heat values, are used in

Great Britain and many other countries. Notice the use of the word "available" in this connection.

The higher heat value includes the heat from condensing the water which is one of the products of combustion. For example, in using a bomb calorimeter to ascertain the heat content of a sample of fuel oil, the products of combustion are cooled to about the temperature of the substances in the calorimeter at the start, say 62° or 72°. Cooling the water vapor or steam which resulted from combustion of the hydrogen in the fuel oil condenses it, causing it to release heat. The higher heating value includes the latent heat of condensation of this water vapor.

The "lower," "net," or "available" heat value is based on the escape of the water vapor without its being condensed and consequently without its releasing the latent heat of condensation.

The principle related to the use of the higher heating values of fuel oil is that a boiler or furnace which is perfect or 100% efficient would absorb all the heat produced by burning the oil, including the heat which can be obtained by chilling the products of combustion to room temperature and as a result condensing the water vapor and extracting the heat from it. With 70° room temperature for the test, the stack temperature would be 70°. Heat balances and efficiency figures based on higher or gross heating values of the fuel oil would charge against the furnace or boiler any failure to behave according to this definition. On this basis, a low pressure steam boiler would not be termed perfect or 100% efficient if it chilled the products of combustion to the temperature of the steam issuing from the boiler, say between 212° and 225°; to be perfect and 100% efficient, the boiler would have to chill the flue gases to room temperature. Chilling the flue gases below the temperature of the steam in the boiler is not impossible. Immediately before leaving a power plant boiler, for example, the flue gases may be further chilled by passing them through an economizer in which they increase the temperature of cold water later used for make-up or for a hot water tank. Or the gases may be further chilled by an air preheater type of economizer which takes in air at room temperature, raises its temperature by cooling the flue gases, and provides heated air for the oil burner.

100% Theoretical Only

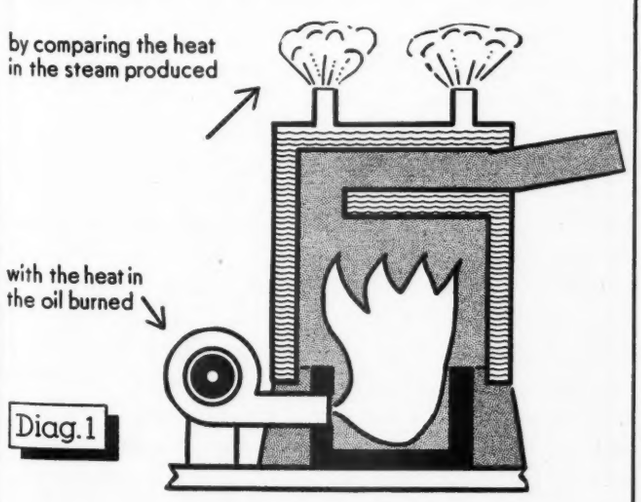
The higher heating value of the fuel oil, and the definition of 100% efficiency that comes naturally of using it, are employed in this country for reporting on almost all evaporation tests of steam heating boilers. Accordingly, while efficiencies of excellent steam heating boilers may be reported at 75% to 85% (with continuous firing), 100% is never reported as the overall efficiency which was determined by making an evaporation test.

The standard evaporation test determines the overall efficiency of a boiler by comparing the heat in the steam produced with the heat in the oil burned. Overall efficiency equals heat output divided by heat input. Evaporation testing methods are used for steam boilers, but the overall efficiencies of hot water boilers and warm air furnaces often are determined by laboratory tests in which the efficiency percentage is determined by dividing the heat output by the heat input. The heat output of a boiler being tested as it would operate for heating water (for a hot water heating plant or for connection to a hot water tank) can be measured by comparing the amount of heat in the water flowing into the boiler with the amount of heat in the water flowing out of the boiler. For a furnace test, the amount of heat in the air flowing out of the furnace is compared with the amount of heat in the air flowing into the furnace.

An overall efficiency test of an oil-fired furnace or boiler may be made for one of these reasons:

1. To show the maximum efficiency attainable under laboratory conditions. Such measures as these may be employed: Before the test, the burner may be fired

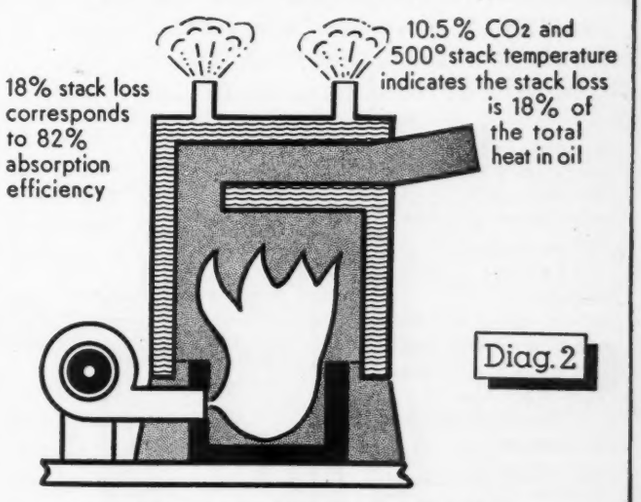
An evaporation test determines the overall efficiency of a boiler —



The principle is: Overall Efficiency = $\frac{\text{Heat Output}}{\text{Heat Input}}$

The same principle is used in determining the overall efficiency of hot water boilers and warm-air furnaces.

"Absorption efficiency" supposes that the flue gas loss is the only loss


18% stack loss corresponds to 82% absorption efficiency
10.5% CO2 and 500° stack temperature indicates the stack loss is 18% of the total heat in oil
Diag. 2

Deduct the estimated stack loss from 100% to determine the "absorption efficiency" — on the basis of continuous operation of the oil burner

continuously for eight to 24 hours; the firebox draft may be "plus" so that products of combustion escape from gas leaks instead of air entering them; the amount of air fed the fire may be reduced to cause the stack to give a trace of smoke or be on the verge of smoking, producing CO_2 content of the flue gases between 13½% and 14¾%.

Efficiency at the Job

2. To show the maximum efficiency attainable on typical installations with continuous burner operation and with adjustments suitable for actual installations. For such a test, negative over-fire draft of perhaps .01" to .04" might be maintained if the boiler or furnace is not designed to operate with "positive" over-fire draft on actual installations. The adjustments would give perhaps 8% to 12% CO_2. The burner "on" time before the test would not be long enough to heat the firebox to temperatures not expected on typical installations.

3. To show the efficiency at which the boiler or furnace probably operates on actual installations, doing its usual work, and fired intermittently in the usual fashion. The burner operation may be perhaps 20 minutes "on" and 60 or 90 minutes "off" to simulate the cycling of a burner on an actual installation. The over-fire draft would be about that which usually occurs on actual installations. The boiler or furnace would be assembled, insulated, and adjusted as it usually is on actual installations. No special efforts would be made to provide an exceptionally efficient combustion chamber, or to seal air leaks which usually are not sealed tightly on actual installations. The burner would be adjusted for the CO_2 percentage expected on actual installations.

Substantially lower efficiency figures result, of course, from pursuing objective #2 than from pursuing objective #1, and still lower efficiencies, which are the result of on-off firing, result from the details of #3. On-off firing gives efficiencies appreciably lower than those of continuous firing. The decrease in efficiency is greater for (a) shorter "on" periods, and (b) a decreased percentage of "on" time out of the total time.

Flue Gas Not Only Loss

Generally the use of the term "absorption efficiency" is based on assumptions of continuous burner operation, and of the flue gas loss being the only loss. Important errors often occur when the term is used, as usually it is assumed in addition that combustion is complete and that "efficiency" can be ascertained through using only CO_2 and stack temperature figures. Regrettably, the installation which shows 20% stack loss according to a stack temperature and a CO_2 reading often operates at 50% to 60% efficiency.

"Preventable stack loss" figures, sometimes used, often are based on the "lower" or "net" heat content of the fuel oil or on the principle that it is impractical for a burner to operate with the CO_2 above some certain percentage, perhaps between 13% and 15%, and with the stack temperature below some certain limit, perhaps 212°, 225°, 300°, or 400°. Indeed, certain figures which have been published are of the premise that 500° is the lowest stack temperature practical for actual installations. One of the complications to assuming there is no stack loss with, for example, 13% CO_2 and 350° stack temperature lies in the fact that actual installations sometimes do show higher than 13% CO_2 and lower than 350° stack temperature, and according to these premises certain installations therefore would have to be listed as 110% or 125% efficient.

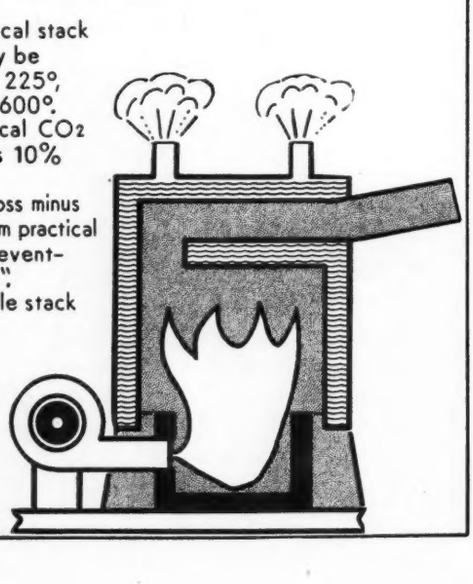
Reference Data

The earlier article on this subject indicated that reference to test data may improve judgment and permit estimating roughly the decrease in efficiency which results from intermittent firing.

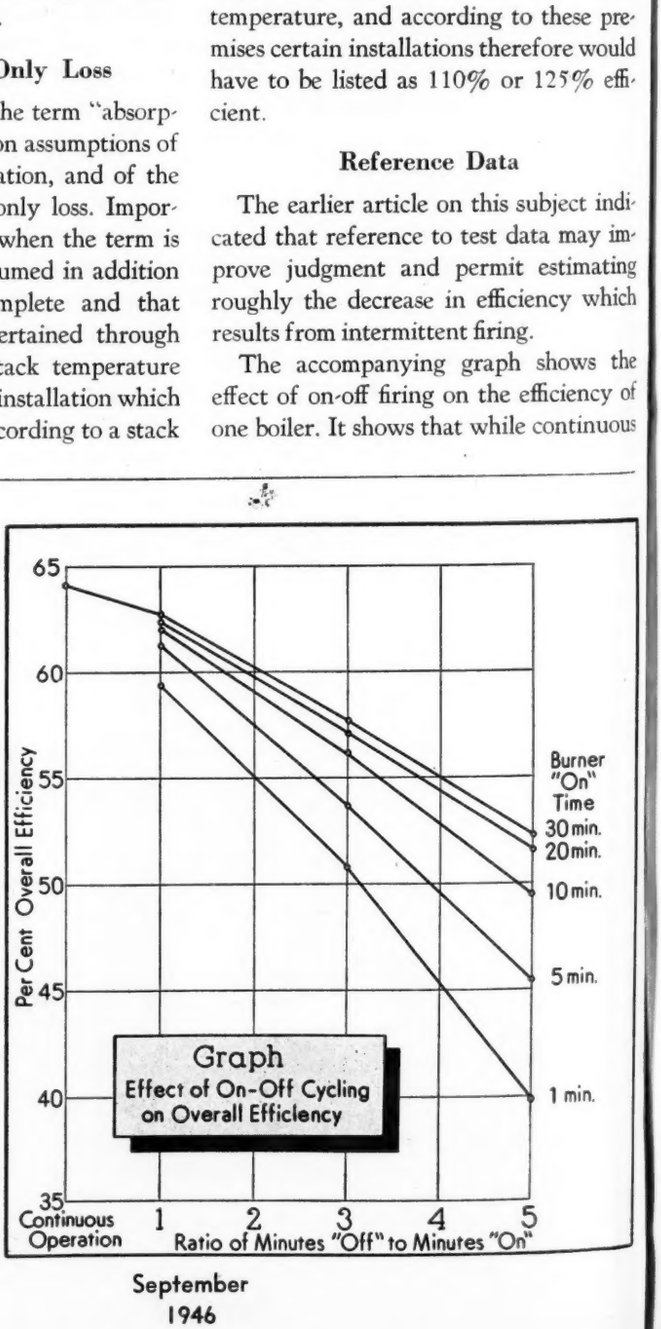
The accompanying graph shows the effect of on-off firing on the efficiency of one boiler. It shows that while continuous

"Preventable stack loss" figures often are based on an assumption that it is not practical to have the stack temperature below a certain minimum or the CO_2 above a certain maximum.

Minimum practical stack temperature may be taken as 212°, 225°, 400°, 500°, or 600°. Maximum practical CO_2 may be taken as 10% to 13.5%.
Actual (gross) loss minus assumed minimum practical loss equals "preventable stack loss".
"Unavoidable stack loss" usually is assumed to be between 10% and 20% of gross heat in fuel oil.



Diag. 3



Effect of On-Off Firing on Efficiency using ordinary and light firebrick

Percent "On" Time	Minutes On	Minutes Off	Overall Efficiency Standard Firebrick	Overall Efficiency Insulating Firebrick	Percent Increase in Boiler Efficiency
50	15	15	72.2	76.0	5.26
40	15	22½	69.3	74.3	7.22
30	15	35	65.2	70.8	8.58
20	15	60	58.5	64.0	9.40
10	15	135	43.5	51.5	18.40

firing produces overall efficiency above 64%, keeping the burner "on" for one minute and "off" for five minutes results in overall efficiency lower than 40%. The tests were made to obtain data roughly applicable to actual installations. The cast-iron boiler used for the test gave a stack temperature slightly higher than 600° with continuous firing at the gph rate used for the tests. The firing and flue clean-out doors fitted well but were not sealed tight-shut with furnace cement, as often is done for laboratory tests. Over-fire draft of negative .02" was maintained for all the tests. The burner was adjusted for 9.0% CO_2 for all the test runs, as this was necessary to secure tolerably clean burning for those tests which included very short "on" periods. Short "on" periods and CO_2 readings above 10% produced excessive chimney smoke and soot in the boiler flues. Anyone especially interested in this graph should look up the graph on the same subject, which appears on page 507 of the well-known textbook, "Fuels and Their Combustion," by Robert T. Haslam and Robert P. Russell. The graph in this book agrees substantially with the graph which accompanies this article.

Burner Cycling Effect

The accompanying table, which shows the effect of on-off firing on efficiency using ordinary and light firebrick has been taken from the article, "Measuring Losses from On-Off Firing," by F. K. Ovitz and J. G. Nellis, which appeared in the booklet, "Knowing A-to-Z of CO_2." Notice that the highest efficiency of 76%, obtained with 15-minute "on" periods and 15-minute "off" periods and light-weight firebrick, contrasts strongly with the 43.5% efficiency obtained with 15-minute "on" periods and 135-minute "off" periods and heavy firebrick. Also, using heavy brick, the boiler which was used for obtaining these test data showed about 79% efficiency when fired continuously; flue gas temperature approximately 440° and CO_2 at 10.0%. Another pertinent detail: During one test with standard firebrick, the overall efficiency increased 3% to 4% after a day's continuous operation, compared to the efficiency after three hours' continuous running.

Two important factors are not shown in the accompanying chart and table on the effect of on-off cycling on overall efficiency.

First: With steam plants (to a much lesser degree with hot water heating plants) higher efficiencies are obtained with intermittent firing if the boiler heats rapidly from a cold start. Especially with exceptionally short "on" periods, say shorter than 15-minutes, a steam boiler which steams rapidly following a cold start gives higher overall efficiency than a boiler which is slow to steam.

Second: Compactness counts. If two boilers show the same low stack temperatures and high CO_2 readings, the smaller invariably shows higher efficiencies.

Boilers designed for exceptionally high rates of heat transfer generally do well at showing high efficiencies, if during on-off overall efficiency tests they show low stack temperatures. For one thing, often they have relatively small amounts of internal heating surface which is not chilled greatly by air flowing over it during the "off" periods. The "internal chilling" of a boiler may be an important factor in tests of on-off firing.

Because the overall efficiencies of boilers and furnaces can be estimated only with difficulty on actual installations, a conservative course is recommended for the service engineers who obtain CO_2 and stack temperature readings as part of their daily work. Taken properly with the help of good instruments, CO_2 and stack temperature readings are in themselves factual and indisputable. Consequently, emphasis rightly should be placed on the readings. Where a man is determined to give a figure for "estimated stack loss" in addition and in spite of the complications which may result from this, he should attach proper qualifications to the numbers he gives. To go further, seemingly it is unwise and rash to dash into statements about the "efficiency" of an installation fired intermittently, unless allowance is made for the decrease in efficiency which is the result of firing the boiler or furnace intermittently.

Plant To Make Petroleum Products From Natural Gas

PLANS ARE BEING COMPLETED for a new $15,000,000 plant at Brownsville, Texas, which will be the first commercial application in this country of the German Fischer-Tropsch process to manufacture petroleum products from natural gas. The first details of the process were given in a paper by P. C. Keith, president of Hydrocarbon Research, Inc., which was presented before the Natural Gas Division of the American Gas Association.

The process, known as the Hydrocol process, uses the hydrogen and carbon of natural gas to carbon monoxide and hydrogen, and then by catalytic action, convert the mixture of gases to gasoline and other petroleum products. Low cost oxygen is a by-product of the process, making possible gasification of coal at reasonable cost.

This process, if widely adopted, will have a far-reaching effect on fuel industries. High grade gasoline can be produced at less cost than by the present petroleum refining processes, and there is sufficient surplus natural gas output to make one-fourth of our country's gasoline requirements. Stated another way, this process raises the value of natural gas at the well from an average of around 1½¢ per Mcf to 12¢ per Mcf, in comparison with crude prices before they got the recent 25¢ raise. With gas made more valuable at the wells there will be less pressure to pipe it out for heating fuels, or else there will be an increase in the cost of heating fuels.

One Washington official, discussing the new development, pointed out that it might be more desirable in our over-all economy to use the new process to make distillate heating oil instead of gasoline, since distillate fuel is showing the greatest rate of gain of all principal petroleum products and needs added supply sources.

◈

E. W. Chapman has been appointed Chief Engineer of the newly created Industrial Pump Division of Bowser, Inc., with headquarters in Fort Wayne, Ind.

Mr. Chapman was formerly Chief Engineer of Blackmer Pump Co., Grand Rapids, Mich., and has been active in the pump industry for the past 15 years.

Fewer New Homes Started; Wait For Better Supplies

HH PRIORITY RATINGS for construction of houses and apartments under the Veterans Emergency Housing Program totaled 632,256 for the six-month period ended July 26, Wilson W. Wyatt, Housing Expediter and Administrator of the National Housing Agency, reported.

Priorities issued between June 29 and July 26 totaled 55,535 units. Mr. Wyatt pointed out that while the figures exceeded the previous four-week period by 9,380, the July total still fell below the program requirements to meet the goals of the Veterans Emergency Housing Program.

"We hoped for a greater number of applications for priorities during July," Mr. Wyatt said. "We recognize that the uncertainty over building prices during the period when OPA was suspended had an adverse effect on the number of issuances. It also must be recognized, that the continued shortage of materials in the face of a rising demand has discouraged builders."

HH priorities issued represent a private builder's intention to proceed with construction and he has 90 days in which to start building. Priority issuances, therefore, are not actual starts on houses. The number of homes and apartments started in 1946 in the first six months totaled 495,000, including both priority and pre-priority housing and temporary re-use units provided from government surplus.

During the January 15-July 26 period, priorities assistance was granted for 514,479 units to be built for sale and 168,046 to be built for rent. Some units are listed as either for rent or for sale and therefore appear in both classifications. The figures do not include temporary re-use rental units at colleges and in congested areas.

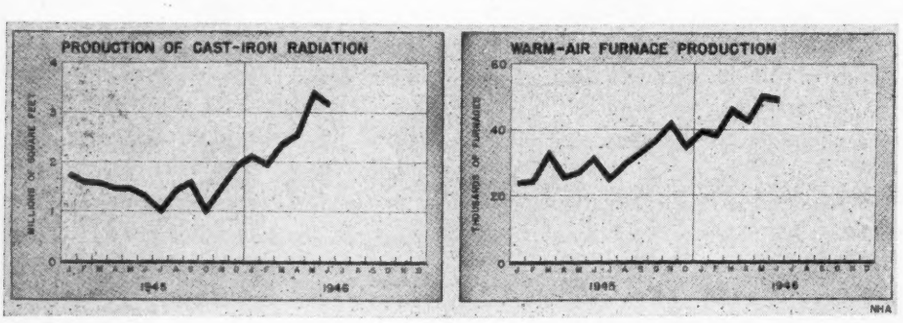
Of the sales units approved, 35.6 per cent are to sell for $6,500 or less and 37.5 per cent of the rental units are to rent for $50 a month (shelter rent) or less.

The states of California, Oregon and Washington have the largest number of authorizations—122,998 to build housing with priorities assistance. Second highest total—108,771—have been authorized for the East North Central States—Illinois, Indiana, Michigan, Ohio and Wisconsin, and the Middle Atlantic Area—New Jersey, New York and Pennsylvania—are third with a total of 104,120.

Other sectional totals are: New England, 19,920; West North Central, 41,528; South Atlantic, 91,787; East South Central, 39,307; West South Central, 69,587; Mountain, 31,153; and the Territories, 3,085.

The HH rating, used only in connection with housing, is issued through the offices of Federal Housing Administration. Thirty types of scarce building materials, as listed in Schedule A to Priorities Regulation 33, are covered by HH priority requirements.

The materials on which HH ratings now apply are lumber, hardwood flooring, millwork, softwood plywood, gypsum board and lath, building board (except hardboard), cast iron radiation, cast iron soil pipe and fittings, structural clay tile, common and face brick, concrete blocks, clay sewer pipe, bathtubs, sinks and sink combinations, water closets, lavatories, warm-air furnaces, prefabricated houses and prefabricated sections and panels, nails, some builders' hardware, some electrical wiring devices, metal doors and frames, metal window sash and frames, metal plaster base (metal lath), low pressure boilers, furnaces, heating registers and grills.



Oilburner Priorities For New Housing

MANUFACTURERS OF FURNACE - BURNER units for the Veterans Housing Program are now able to get priority help to secure the necessary oilburners. This applies principally to the old-line furnace manufacturers who were making complete oil-fired units by purchasing oilburners from burner manufacturers. With steel and cast iron plentiful through a temporary arrangement under CPA's M-21, the furnaces were being put together in considerable volume, and then being held up at the factories, waiting for oilburners.

Under the new arrangement set up in early August by the Heating Section of CPA's Plumbing & Heating Branch at Washington (Morgan Johnston is section head) furnace manufacturers can ask CPA for a CC rating to get oilburners. These are supposed to be used only for furnaces going into new homes. The furnace manufacturer orders burners from any burner factory he may choose, evidences the CC rating, and the oilburner manufacturer is required to fill that order before he can ship burners to others. If, in turn, the burner manufacturer is unable to get the necessary parts to promptly assemble the burners for the rated order, he can ask CPA for priority assistance in getting these parts. However, he cannot expect to get such priority assistance if he is able to put together enough burners without it.

Just at press time has come through a revision of Schedule A to Priorities Regulation 33, including oilburners in the list of materials for HH ratings.

A builder can get from FHA authority to use this rating for burners. He then orders from any dealer and the dealer must fill his order before unrated orders, up to 75% of the dealer's monthly burner receipts.

As explained in the article "Oilheating the Veterans" in the May issue of FUEL-OIL & OIL HEAT, it is important to keep in mind that the Housing Program is backed with more emergency authority from the President than were the war-time programs. As the program starts to bog down temporarily due to material stringencies, any industry can expect its product to be forcibly channelled into housing, wherever necessary to use the

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Act's forcing provisions. The over-all impact on the oilburner industry, however, will not be too serious, since only about 50,000 burners will go into new homes in the second half of this year, according to CPA thinking.

◈

Motors Look Plentiful For Balance Of Year

NINE PRINCIPAL manufacturers of oilburner motors have agreed in signed statements to the Civilian Production Administration to produce a total of 245,000 oilburner motors in the second half of this year. The same group produced 119,000 burner motors in the first half. Not included in the group are several small motor manufacturers, most of whom have started making burner motors within the past few months. Their potential output for the year is unknown, but can hardly total less than 20,000. In addition are the three oilburner manufacturers who produce their own motors, and will turn out a total of at least 50,000 in 1946. Thus, motor supply will become progressively more satisfactory and by the year end promises to be adequate for all current needs.

Transformers now become the principal bottleneck to burner production, a situation impossible to correct until larger quantities of suitable wire come through from the drawing mills. August copper fabrication, however, is running importantly above any month since last winter, with some of the industry's strikes out of the way.

◈

Furnace Prices Raised

THE MAXIMUM PRICES for warm air furnaces were raised 10% over the June 30, 1946 prices, effective August 28, according to an OPA announcement. A previous increase had been granted last April 19. The new action brings prices for furnaces to an average of 31.7% above March 1942 prices. Jobbers are permitted to also increase by 10% their prices in effect on March 31, 1946. In the instance of furnace-burner units, the increase can be applied only to the furnace proper and not to the burner attached to it.

◈

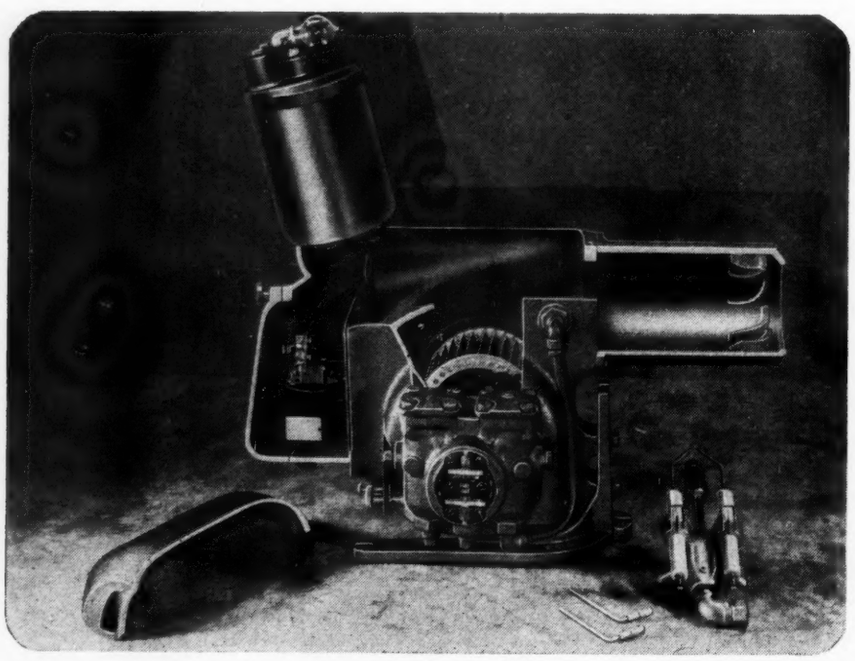
Board of Underwriters Report More Oil Fires

FIRES INVOLVING oilburners are increasing due to conditions brought about by the war, according to engineers of the National Board of Fire Underwriters. The principal cause is said to be lack of proper maintenance due to shortages of materials and scarcity of trained service men.

The Board points out that many burners installed during the war do not meet the minimum standards for safety and reliability. Others are wearing out after years of service, having been used longer than the reasonable life of such devices. The Board believes that increased production of oilburners will before too long correct the hazard of the worn-out burner. Chief among the faults causing oilburner fires is simple failure to check and clean the burner each year, resulting in clogged nozzles and excessively dirty heating plants.

◈

Ross A. Gridley has been named director of the Construction Branch of the National Housing Agency by Housing Expediter Wilson W. Wyatt.



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Although Hercos require a minimum of servicing, dealer service men recognize the need for accessibility to save time on service calls. Constructed to give ready access to any part of the assembly, Herco Oil Burners are easy to install—easy to service. And every minute saved means more profit for you!

Herco's exclusive method of mounting Visaflame directly on the transformer, inside the burner, permits immediate access to the complete ignition head assembly. The top plate can be removed and the entire transformer, with Visaflame attached, swings back for easy removal of any part, yet wiring between Visaflame bulb and relay panel remains fully enclosed.

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B Boiler tubes scientifically staggered for maximum heat transfer.

C All tubes readily accessible for complete and easy cleaning.

D Flue and fire doors of sturdy cast iron. Doors and frames precision ground and fitted.

E Removable plate for insertion of hot water coils and for internal inspection.

F Submerged coil for year 'round service hot water.

G Patented service hot water connection at rear of boiler.

H Integral base results in gas tight unit.

Jacketed "C" type boiler for medium-size construction. There is a special Spencer type for every firing method — every building size. Capacities range from 400 sq. ft. to 42,500 sq. ft. (steam) — unqualifiedly guaranteed.

A good boiler is cheap at any price. When a Spencer, the best in heating carries *no price premium* . . . it is sound business practice to have one on your job. Write or wire for a catalog of the complete line of modern, all-fuel Spencer steel boilers *today.*

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Division—The Aviation Corporation, Department F-7

Cast Iron and Steel Boilers **SINCE 1890**

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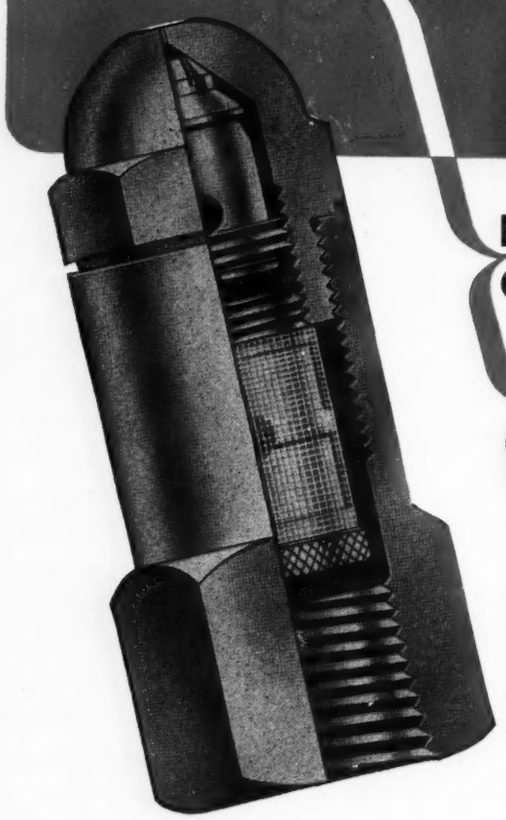
Philadelphia Families Now Use These Fuels

Rental Group	Coal		Coke		Oil		Gas		Central Steam Plant	
	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number
Over $50.00	41.3%	50,260	3.8%	4,678	44.2%	53,744	8.2%	9,952	2.7%	3,284
$40.00 to $49.99 ..	68.4	64,492	9.2	8,659	19.5	18,412	3.1	2,986	..	....
$30.00 to $39.99 ..	78.1	109,776	8.1	11,445	11.7	16,422	2.3	3,184	..	....
Under $30.00	85.1	127,989	8.7	13,237	5.9	8,957	.8	1,192	..	....
Total	69.6	352,517	7.5	38,019	19.2	97,535	3.4	17,317	.6	3,284

Philadelphia Families Would Prefer to Use These Fuels

Rental Group	Coal		Coke		Oil		Gas		Central Steam Plant	
	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number
Over $50.00	7.1%	8,659	.3%	398	42.9%	52,151	47.8%	58,222	1.9%	2,289
$40.00 to $49.99 ..	12.2	11,545	2.1	1,991	39.3	37,023	46.4	43,791	..	....
$30.00 to $39.99 ..	18.7	26,275	1.9	2,687	40.7	57,227	38.9	54,639	..	....
Under $30.00	29.1	43,790	2.8	4,279	41.4	62,303	26.7	40,109	..	....
Total	17.8	90,269	1.8	9,355	41.2	208,704	38.8	196,761	.5	2,289

TRIPLE TESTED for



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In ordering, please give complete information about capacity, spray angle, quantity, etc.

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Philadelphia Newspaper Surveys Fuel Preferences

THE PHILADELPHIA Bulletin has just published the results of an interview survey covering all important phases of the city's housing characteristics and desires, including a section on heating fuels. The tables show present fuel uses and fuel preferences, separated into rental groups. This does not mean that only renters were interviewed, but rather than the persons lived in homes that would normally rent for about the figures indicated.

◈

"American Home" Survey Shows Fuel Preferences

IN A RECENT survey of higher income families on its own circulation list, *American Home* found 1,735 readers planning new heating equipment installations within the next year. Of these, 45% want to use gas, 39% want oilheating, 10% stoker heating, 3% hand-fired coal and 3% electricity. The strong gas showing is somewhat influenced by returns from the Southwest and from California, but in any event the survey again emphasizes the fact that gas is stronger in public acceptance than it was before the war, and that coal is considerably weaker. Of all centrally heated residences before the war, 17% were oilheated, 8% burned gas and the remaining three-fourths used coal in one form or other.

◈

Walter A. Juergens has been named Cincinnati representative for the White Mfg. Company with offices in the *Times-Star* Tower.

Introducing Silent Glow's New Plant . . .

Ready to serve you and your customers

This new plant, which doubles manufacturing space, will be used in the production of power burners and additional types of heating equipment. It will permit SILENT GLOW to keep pace with the constantly increasing demand for the famous Air-Seel Burner and other popular SILENT GLOW products.

AERIAL VIEW of new factory, containing 54,000 square feet of space.

THE SILENT GLOW OIL BURNER CORPORATION
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TO THE TRADE:

The purchase of additional manufacturing facilities represents the initial step in carrying out a long-range program designed to place both you and ourselves in the strongest possible position to meet the ever-growing demand for Silent Glow burners.

Many months ago, the need was recognized for obtaining the most up-to-date physical equipment and facilities if we were to fulfill a constant obligation to our dealers, namely: To continue quantity production of highest quality burners at prices acceptable to customers and offering assurances of a full measure of profit to you.

The acquiring of 54,000 more feet of floor space is indicative of our firm resolve to be organized and ready to help you benefit from what we have repeatedly described as the most lucrative market for oil burners the country will have ever witnessed.

Right now it is only the lack of a few essential materials that is blocking full scale production. Our labor supply is adequate and well trained. Additional skilled hands are available to man the newly purchased plant which is located in the heart of one of Hartford's largest manufacturing districts. Wartime experience has proved priceless in perfecting methods for production efficiency and economy.

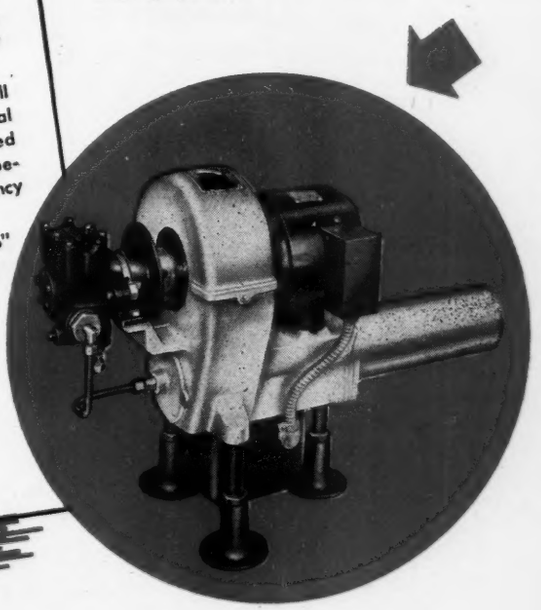
As soon as a few more procurement hurdles can be overcome, the "go" signal will flash at every Silent Glow machine and assembly bench and burners—with significant new features and improvements—will go forward in quantities that will enable you to fill both pending and potential orders.

Sincerely,

Ross Sherman

President, The Silent Glow Oil Burner Corporation

***The new* SILENT GLOW *Air-Seel* . . . the burner that saves fuel by locking out cold air . . . can be adjusted to meet the exact heating requirements of any home. An outstanding example of a fine line of heating equipment.**



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Russian Reserves Largest But Production Second

FACTS ABOUT PETROLEUM in Russia are as hard to get as authentic information on many other activities of the country, but the August issue of *The American Review of the Soviet Union* contains an article by Andrew D. Perjda, geologist, which may be as good a guess as can be made. In a search of Russian literature, Mr. Perejda has been unable to find any figures on Soviet oil production during the war years, but assumes that production may have declined while the fighting was going on. Production in 1940 was 31,193,500 metric tons, or 226,464,810 barrels. This output is believed to have declined in 1945 to 20,460,000 metric tons or 148,539,600 barrels. It is pointed out that the Baku field, largest in the U.S.S.R., was down 9% in 1945, compared with 1940, and the Maikop-Grozny region accounted for only 7% in 1945, against 16% in 1940. The wells in this latter area were destroyed before the Germans occupied the territory.

Reserves in the Soviet Union have been variously estimated up to 46,291,938,000 barrels, compared with U. S. reserves of 20,827,000,000 barrels. However, the U. S. produces 60% of the world's petroleum out of one-fifth of the world reserve, and the U.S.S.R. produces 11% out of four-fifths of all the world's petroleum.

Summing up, Mr. Perejda says, "The U.S.S.R. ranks a very poor second among the oil producing nations of the world, despite her claim that she has the world's largest reserves of oil.

"The most striking drawback to the Russian petroleum economy is that her large areas of potential oil reserves are in the Siberian high latitudes * * * where inclement weather conditions prevail most of the year. In addition, there are no rail transportation lines in the far north of Siberia, and the rivers, icebound for most of the year, are of little or no aid in transporting the petroleum * * * to centers of population. Thus, from the standpoint of petroleum economy the U.S.S.R. is not an economic or geographic unit as far as her Siberian oil potential is concerned. Therefore, it is very unlikely that the U.S.S.R.'s petroleum development will move on a large commercial scale into the large Siberian oil potential areas."

Transferring, Proportioning, Processing

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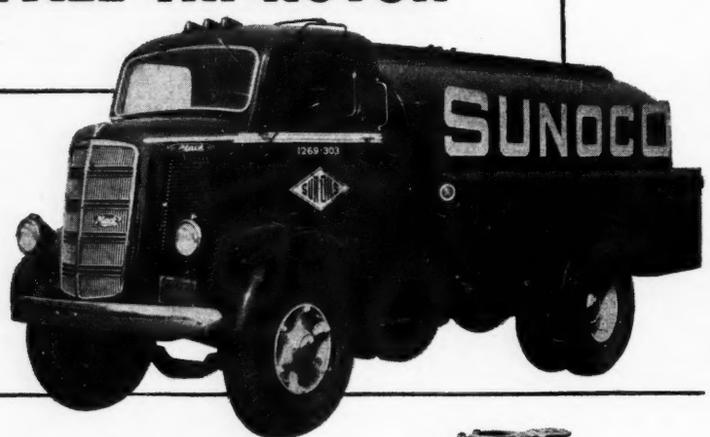
YALE TRI-ROTOR

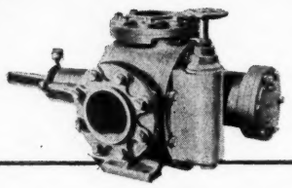


Because Tri-Rotor combines the high volumetric efficiency of a rotary pump with the positive handling characteristics of a piston pump . . . Sun Oil Company uses the Yale Tri-Rotor—the *only* modern low-pressure pump with *both* features.

Sun Oil depends on Tri-Rotor pumps for quiet, safe, economical operation . . . no overheating, chewing, foaming or agitating of product. With only three moving parts, Tri-Rotor reduces maintenance problems.

Three head styles: Solid, By-pass, Variable Volume — optional for all truck pump installations. Sizes 5 gpm to 200 gpm.

Write your pump requirements to the Yale & Towne Manufacturing Company, 213 Henry Street, Stamford, Conn.



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PROTECTIVE — *Piston Action*
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OF LOCKS, HARDWARE, HOISTS AND INDUSTRIAL TRUCKS

British Industry Advised To Convert To Oil

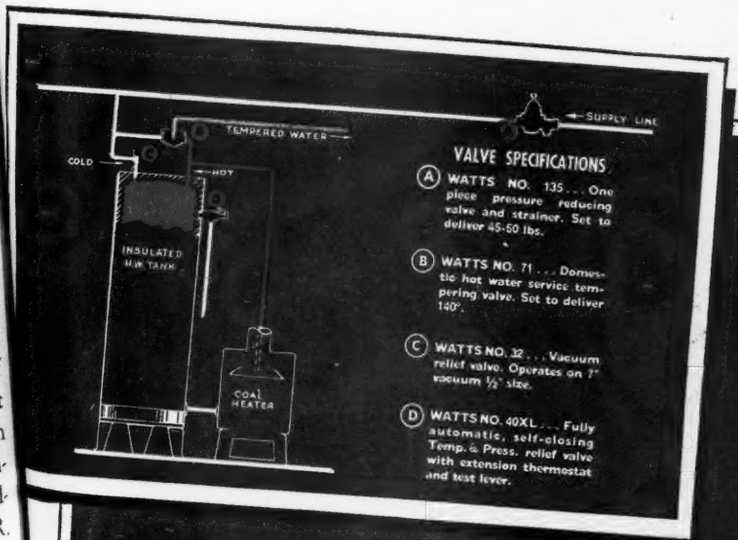
BRITISH INDUSTRY has been officially advised by the Government to start planning to use oil fuel as an alternative to coal, sanctioning a trend that has been unofficially evident for some time. High coal cost, added to dwindling output resulting from miners' refusal to produce to capacity, forces industry to the other fuel source. Many manufacturing plants have already made the switch as the only assurance of maintaining top output of their products.

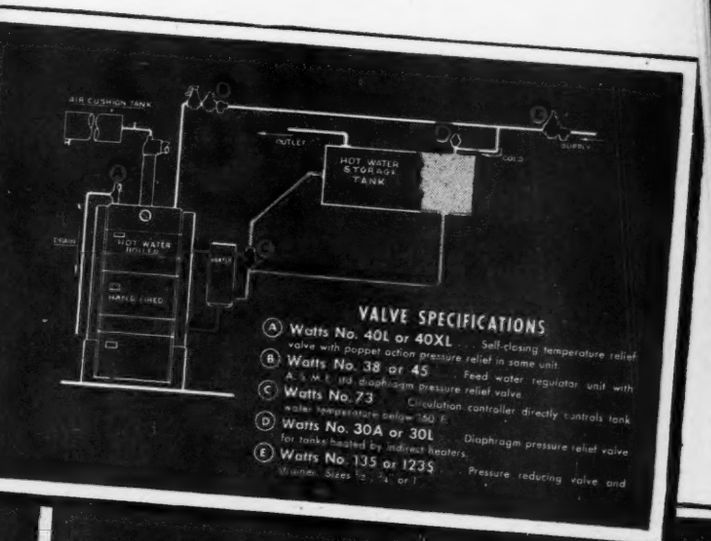
To encourage the shift to oil, the Government has announced a subsidy of one pound per ton to all users of heavy fueloil and gas oil until such time as the import duty is removed. This assistance starts October 1 and applies to imports and home production alike. The subsidy is said to virtually equalize oil costs with coal. Arrangements have been made by the Ministry of Fuel for the mass production of the oilburning equipment required.

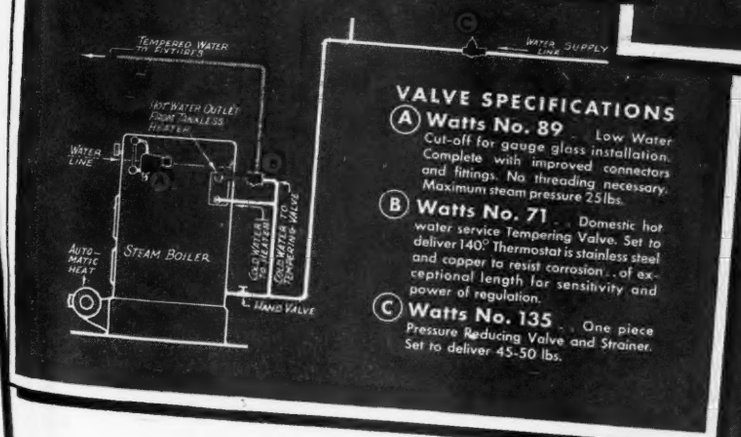
Practical Applications

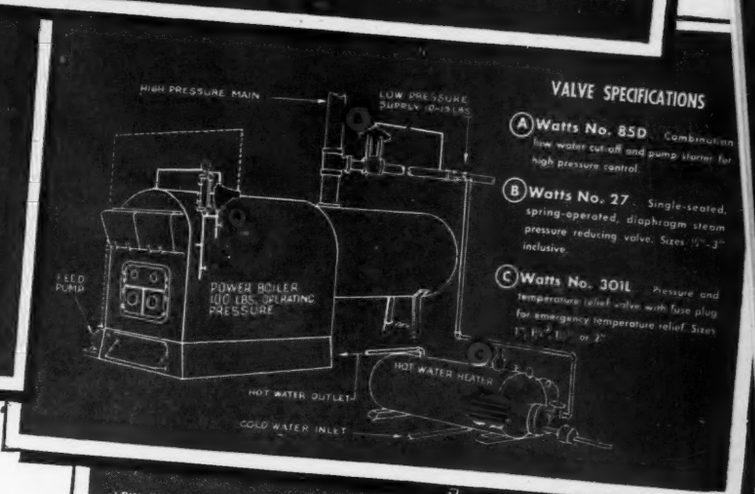
To Plumbing and Heating Installations

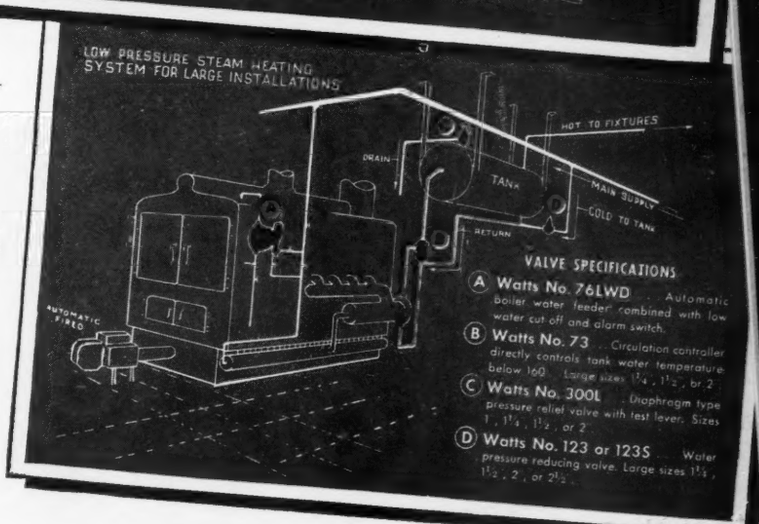
OF WATTS PRODUCTS


SUPPLY LINE
TEMPERED WATER
COLD
HOT
INSULATED H.W. TANK
COAL HEATER
VALVE SPECIFICATIONS
(A) WATTS NO. 135 . . . One piece pressure reducing valve and strainer. Set to deliver 45-50 lbs.
(B) WATTS NO. 71 . . . Domestic hot water service tempering valve. Set to deliver 140°.
(C) WATTS NO. 32 . . . Vacuum relief valve. Operates on 1" vacuum ½" size.
(D) WATTS NO. 40XL . . . Fully automatic, self-closing Temp. & Press. relief valve with extension thermostat and test lever.


AIR CUSHION TANK
OUTLET
HOT WATER STORAGE TANK
COLD
SUPPLY
DRAIN
HOT WATER BOILER
GAS FIRED
VALVE SPECIFICATIONS
(A) Watts No. 40L or 40XL . . . Self-closing temperature relief valve with poppet action pressure relief in some unit.
(B) Watts No. 38 or 45 . . . Feed water regulator unit with A.S.M.E. std. diaphragm pressure relief valve.
(C) Watts No. 73 . . . Circulation controller directly controls tank water temperature below 160° F.
(D) Watts No. 30A or 30L . . . Diaphragm pressure relief valve for tanks heated by indirect heaters.
(E) Watts No. 135 or 123S . . . Pressure reducing valve and strainer. Sizes ½", ¾", or 1"


TEMPERED WATER TO FIXTURES
HOT WATER OUTLET FROM TANKLESS HEATER
WATER LINE
AUTOMATIC HEAT
STEAM BOILER
COLD WATER TO HEATER
COLD WATER TO TEMPERING VALVE
HAND VALVE
WATER SUPPLY LINE
VALVE SPECIFICATIONS
(A) Watts No. 89 . . . Low Water Cut-off for gauge glass installation. Complete with improved connectors and fittings. No threading necessary. Maximum steam pressure 25 lbs.
(B) Watts No. 71 . . . Domestic hot water service Tempering Valve. Set to deliver 140°. Thermostat is stainless steel and copper to resist corrosion . . . of exceptional length for sensitivity and power of regulation.
(C) Watts No. 135 . . . One piece Pressure Reducing Valve and Strainer. Set to deliver 45-50 lbs.


HIGH PRESSURE MAIN
LOW PRESSURE SUPPLY 10-15 LBS.
FEED PUMP
POWER BOILER 100 LBS. OPERATING PRESSURE
HOT WATER HEATER
HOT WATER OUTLET
COLD WATER INLET
VALVE SPECIFICATIONS
(A) Watts No. 85D . . . Combination low water cut-off and pump starter for high pressure control.
(B) Watts No. 27 . . . Single-seated, spring-operated, diaphragm steam pressure reducing valve. Sizes ½"-3" inclusive.
(C) Watts No. 301L . . . Pressure and temperature relief valve with fuse plug for emergency temperature relief. Sizes ½", ¾", 1", 1¼", 1½", or 2"


LOW PRESSURE STEAM HEATING SYSTEM FOR LARGE INSTALLATIONS
HOT TO FIXTURES
DRAIN
TANK
MAIN SUPPLY
COLD TO TANK
RETURN
AUTOMATIC FIRED
VALVE SPECIFICATIONS
(A) Watts No. 76LWD . . . Automatic boiler water feeder combined with low water cut-off and alarm switch.
(B) Watts No. 73 . . . Circulation controller directly controls tank water temperature below 160°. Large sizes 1¼", 1½", or 2"
(C) Watts No. 300L . . . Diaphragm type pressure relief valve with test lever. Sizes 1", 1¼", 1½", or 2"
(D) Watts No. 123 or 123S . . . Water pressure reducing valve. Large sizes 1¼", 1½", 2", or 2½"

There are so many opportunities for the practical application of Watts products to residential, institutional, and industrial plumbing and heating installations that we are not able to illustrate all of the many possible installations where PROTECTION AND CONTROL services are needed and can be used. ☆ These diagrams show fundamentals of installation and positioning of Watts products as applied to average systems. ☆ We welcome requests for diagrams, sketches, and recommendations for the use of our products. All such requests should state clearly the necessary details of the problem or requirements and the result desired or needed in PROTECTION AND CONTROL service. ☆ We freely offer this service for we believe a better understanding of the proper uses of Watts products will help us both to render a better service to your clients.

WATTS REGULATOR COMPANY **Lawrence, Mass.**

Industry Groups

Activities of local and national industry associations are reported monthly in this department. Secretaries are invited to send reports of their groups' activities, to reach the editor by the 20th.

Brooklyn-Queens Group Formed

FUEL OIL AND HEATING COUNCIL, INC., with headquarters at 827 Grand St., Brooklyn, is a new oilheating trade association recently formed in the New York area. It is somewhat different from the other associations in the city in that each of its members operates a fleet of fueloil trucks but none of them operate bulk plants. Moreover, nearly all of them have oilburner sales and service departments.

The group was formed in the belief that there are numerous problems common to operators of this particular type that are not shared by the tidewater bulk plant operators of the city nor by the strictly oilburner dealers.

Norris R. Skaggs is president, Joseph Reiss, vice-president, Albert G. Baerenklau, treasurer and M. H. Conviser, secretary. The group also has a professional executive secretary, Fred W. Wilson, who was with Royal Petroleum Co. The four officers are directors, as are also J. P. Leonard, L. J. Ottaviano and Arnold Washton.

The new council is associated with Atlantic Coast Oil Conference, of which Clyde Morrill is managing director.

New England OHI Outlines Job Training for Veterans

OIL-HEAT INSTITUTE OF NEW ENGLAND is currently educating its membership in the possibilities of training Veterans as oilheating mechanics under the Government program in which a part of the man's income comes from the Veterans Administration. The Institute's educational department has prepared and distributed to members a comprehensive schedule or outline of the training course to be undertaken by dealers participating in the program.

The details of the course have been submitted to, and approved by, the Department of Education, Board of Collegiate Authority of the Commonwealth of Mass.

North Carolina Oil Men Meet Atlantic Beach, Sept. 3-4

NORTH CAROLINA OIL JOBBERS ASSN., will hold its annual fall meeting at the Atlantic Beach Hotel, Atlantic Beach, N. C., September 3 and 4. On the first morning the oil jobbers will hold a closed session to discuss current problems, with the afternoon free for committee meetings. That evening at the annual banquet Col. J. H. Hatcher, director of the State's Highway Safety Division, will talk on progress in highway safety. Wednesday morning the speaker will be Robert Gray of FUELOIL & OIL HEAT, who will discuss the state's growing opportunities as an oilheating market.

Refrigeration Show Officials Expect Sell-Out At Cleveland

THIRTY-SEVEN MORE EXHIBITORS for the Fourth All-Industry Refrigeration and Air Conditioning Exposition to be held October 29 to November 1 in the Cleveland Public Auditorium were announced June 1 by K. B. Thorndike, chairman of the two-association show committee sponsoring the event.

(*Please turn to page* 68)

Here's how more deliveries per day at lower cost can be attained! (1) The driver can pre-set the exact amount of oil to be delivered, (2) leave the truck and attend to the delivery himself at a distance of many yards. The delivery is measured and controlled directly on the truck meter and (3) the ticket printer provides a printed record of the transaction for both the customer and home office. Contact the nearest office and a Smith Meter Company representative will furnish complete information.

Illustrated, H-3Z Meter equipped with automatic set-stop, large numeral counter and ticket printer.

SMITH METER COMPANY

SUBSIDIARY OF A. O. SMITH CORPORATION

Factory—5743 Smithway, Los Angeles 22, Calif.

SALES OFFICES: NEW YORK, CHICAGO, HOUSTON, LOS ANGELES

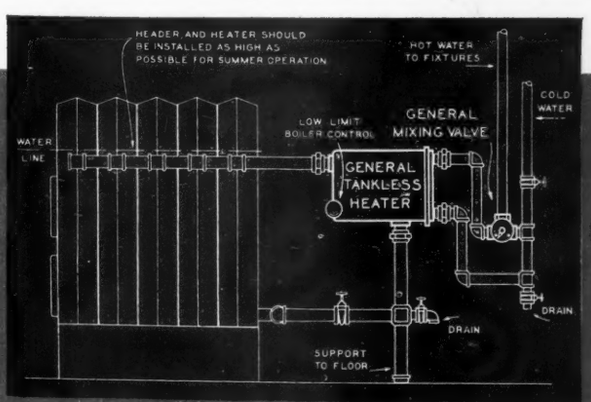
Local Stocks at Convenient Points • Local Agents In All Principal Cities

WANT GEYSERS OF HOT TAP-WATER

FOR JUST A DROP IN THE ?

Up to 35 gallons of hot water a minute is standard performance in home installations of General Tankless Water Heaters. Require no storage tank. Space-saving, simple, easy-to-install, they use boiler water to give you an instantaneous supply of hot water – continuous, pure, rust-free . . . at minimum cost. No complicated piping, no waiting till a tank re-heats. For a hot water supply as dependable as "Old Faithful" itself, specify General Tankless Heaters. Write today for Catalog 16. General Fittings Company, 125 Georgia Avenue, Providence, Rhode Island.

70 G.P.M. capacity for factory washrooms and industrial processes.



GENERAL

TANKLESS WATER HEATERS

Also Tank-Type Water Heaters • Thermostatic Mixing Valves
Water-Hammer Silencers • Live-Steam Heaters
Coil-Heated Tanks • Pipe Unions

Industry Groups

(*Begins on page 60*)

The new list brings the total number of exhibitors to 142. A previous announcement included 105 companies which are members of the Refrigeration Equipment Manufacturers Association and the Frozen Food Locker Manufacturers and Suppliers Association.

With four exhibition halls in the Cleveland auditorium used for the event, the number of displays is expected to exceed 300, covering 75,000 square feet of floor space. This will make the show, first conducted by the refrigeration and air conditioning industry in six years, by far the largest in the industry's history. The event is sponsored by REMA with the cooperation of the frozen food locker group.

Buffalo OHI Elects

OIL-HEAT ASSOCIATION OF WESTERN NEW YORK with Buffalo headquarters recently elected as new officers Joseph A. Collins, president, Wm. R. Sprague, vice-president, F. R. Kirschofer, secretary, and Kenneth Reid, treasurer.

Wisconsin OH Outing

WISCONSIN OIL-HEAT ASSOCIATION, INC., Milwaukee, held its annual golf outing August 9 at the North Shore Country Club. Grover C. Fillbach was chairman for the day.

New York Power Show To Be Largest Ever Held

ORGANIZATION of the 17th National Exposition of Power and Mechanical Engineering, better known as the National Power Show, has been going forward for some time and is now practically completed. The Exposition will return to Grand Central Palace, New York, the week of December 2-7, next, same week as A.S.M.E. meetings; for the first time since 1940. All the available exhibition space on four floors will be occupied. Over 300 leading manufacturers have already engaged space, and the remaining spaces will undoubtedly be exhausted in the near future.

Attendance at these expositions, which are normally held every two years is restricted to qualified visitors, classified according to buying influence in the field of power production and use. The Exposition has been designed to provide maximum display and engineering information for these groups. Invitations this year will be based on revised lists, recognizing thousands of dislocations resulting from the war and to the incidence of new industrial projects, especially the numerous smaller specialty manufacturers who are mobilizing at the present time.

First established in 1922, the National Exposition of Power and Mechanical Engineering is conducted by the International Exposition Company, with permanent headquarters in Grand Central Palace, New York.

◈

Harold D. Hauf, architect and engineer, has been appointed director of the technical branch of the National Housing Agency, with a major responsibility to encourage development of new materials and new methods of construction. The branch is also responsible for recommending modernization of local building codes to expedite the Veterans Housing Program.

Look INTO THE FLAME WITH A "COMBUSTION XRAY LENS" To Check OIL FIRES!

We've been able to obtain a limited number of lenses which will permit you to look right into the center of the flame to see how the oil burns—while at the same time *protecting your eyes* against the injurious rays of the fire box. You can now observe and check the fire for black streaks, ragged ends, uneven or torch-type flame, smoky tips, "cold fire" and then make the necessary adjustments.

This will also enable you to check the claims that we've been making for KLEEN-FLO. A real "before and after" test. First observe the fire as is—then add KLEEN-FLO to the tank as instructed—24 hours later look again through the "Combustion XRAY Lens." You should notice a definite improvement—a bright, hot fire, clean tips, elimination of black streaks and ragged ends—a clean, steady and more efficient oil fire. Take advantage of our special offer listed below—TODAY.

SPECIAL TRIAL OFFER

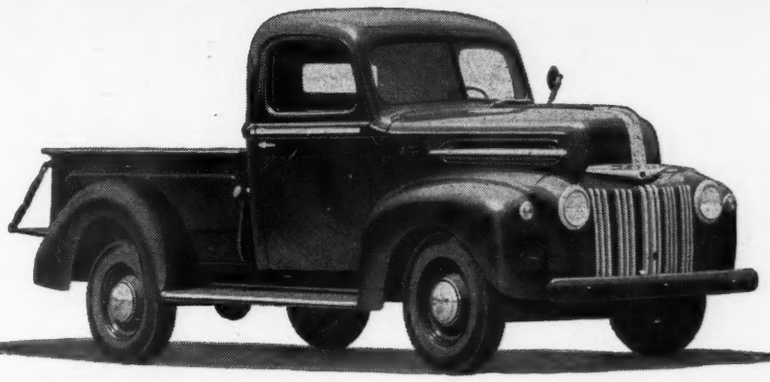
1 "Combustion XRAY Lens" BOTH FOR $1.50
1 Quart KLEEN-FLO

COMBUSTION UTILITIES CORPORATION
1451 BROADWAY NEW YORK 18, N. Y.
CANADIAN DIVISION
1253 McGill College Ave., Montreal 2

New England Distributor
ALLIED APPLIANCE COMPANY
111 Berkeley Street Boston 16, Mass.

West Coast Distributor
DIAMOND OIL CO., INC.
550 Bauchet St., Los Angeles 54, Calif.

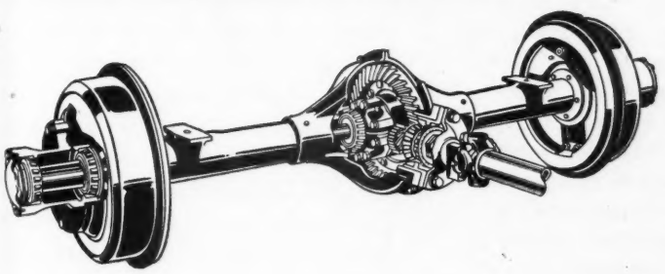
REGISTRATIONS *SHOW* IT — OPERATORS *KNOW* IT!



The Ford Half-Ton Pickup

"FORD TRUCKS LAST LONGER!"

One big reason— FORD AXLES STAND UP!



Ford Truck axle shafts carry no weight load, because *ALL* Ford Trucks have ¾-floating or full-floating axles. All weight stresses are carried on the axle housing—none on the shafts—minimizing shaft breakage. Driving pinion is straddle-mounted on 3 large roller bearings, maintaining positive mesh with ring gear—no destructive springing away under stress. Differentials have 4 sturdy pinions, even in light duty chassis, spreading the load and strain.

Ford

ONLY in a Ford Truck will you find all these long-life features: your choice of two great truck engines, the 100-H.P. V-8 or 90-H.P. Six—triple-life Silvaloy V-8 rod bearings—Flightlight aluminum alloy, 4-ring pistons—efficient air- and oil-filtering—full pressure lubrication—heavy channel section frames, *doubled* between springs in heavy duty models—semi-centrifugal clutch—big hydraulic brakes, with non-warping, score-resistant cast drum faces for maximum life. More than 50 such long-life features contribute to Ford Truck endurance . . . and that endurance is proved by the fact that 7 out of 11 of all Ford Trucks built since 1928 are still in use. See your Ford Dealer!

FORD TRUCKS

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

fuelfoil & oil heat

Manufacturers Activities

Airtemp Drills Representatives At Five-Day Sales Conference

THE FIRST SALES CONFERENCE since 1941 of all field sales personnel of Airtemp Division of Chrysler Corporation was held in Dayton, July 15-20. More than 100 regional managers, district coordinators, field engineers, field sales representatives and district representatives were present to confer with sales department heads on the dealer distribution program.

After seeing the facilities for research, development and mass production of Airtemp products, those in attendance went into conference with sales heads of the division at the Engineers' Club auditorium. They were officially greeted by H. A. Malcom, general sales manager, who in turn introduced President D. W. Russell.

In subsequent sessions throughout the week, every phase of policies and procedures which govern sales operations of the Chrysler Airtemp home office, field and dealer organizations was covered. Talks by sales department heads and question-and-answer discussion periods in which the field men took an active part left them thoroughly acquainted with Airtemp's plan of operation for its greatly expanded activities.

Birthday Cake *presented to D. W. Russell, Airtemp's president, on his 15th anniversary with Chrysler. Shown are C. L. Jacobson, Chrysler's chief of subsidiary companies, Russell, and H. A. Malcom, vice-president and sales manager of Airtemp.*

Davisbilt Expands Facilities

THE ENTIRE TRUCK and trailer tank manufacturing facilities of Krieger Steel Sections, Inc., Long Island City, N. Y., have been leased by the Davisbilt Products Co., Cincinnati, Ohio, to facilitate delivery of truck and trailer tank orders held by the company, and to meet the unprecedented volume demand anticipated.

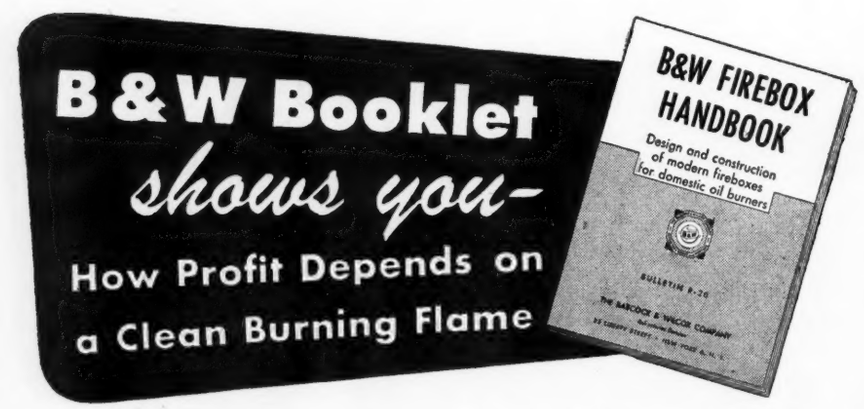
This expansion program, together with the modern production facilities recently acquired for the manufacture of Davisbilt parts through affiliation with the Liberty Aircraft Products Corp., Farmingdale, L. I., makes possible greatly accelerated production. Standard truck and trailer tanks will be built and stocked for immediate delivery.

Heil Training GIs for Supervisory Positions

THE HEIL CO. is pointing the way to a new type of "on-the-job" educational program designed to fit qualified men for supervisory positions. This program was launched last January and has been widely cited for its basic practicability.

The Heil program now has 20 men in training, their ages ranging from 22 to 28.

(*Please turn to page* 80)


B&W Booklet
shows you-
How Profit Depends on
a Clean Burning Flame
B&W FIREBOX HANDBOOK
Design and construction of modern fireboxes for domestic oil burners
BULLETIN R-26
THE BABCOCK & WILCOX COMPANY

Today, more than ever, the oil burner dealer must make certain that his installations include a firebox which assures a *clean burning flame*. Odors, soot and smoke must be eliminated to meet the competition of other heating fuels — and the problem of realizing full efficiency must be solved.

To help the oil burner dealer lick these problems, Babcock & Wilcox, makers of B&W Insulating Firebrick, have prepared the comprehensive B&W Firebox Handbook which shows how you can profit by proper firebox design and construction.

This free booklet explains how figuring g.p.h. rates; altering firebox shape for long or short firing periods; building your firebox with B&W I.F.B. to reach high temperatures quickly after a cold start — can help you attain the all-important *clean burning flame*. It also contains a wealth of practical solutions to the many other problems facing oil burner dealers.

Write today for your free copy of the B&W Firebox Handbook. It is your guide to increased profit through customer satisfaction with better firebox performance.

B&W

Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

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A Masterpiece in Room Temperature Control
The Mercoid Sensatherm is unexcelled in its simple beauty. Its appealing lustrous alumilite natural metallic finish will last a lifetime. There is no lacquer coating to become dull, nor can it ever tarnish. It holds its newness in appearance indefinitely. To clean simply wipe off any accumulated dust with a cloth.
The performance of this instrument is unmatched for its even room temperature control. There are many factors in its design and construction contributing to its long life and positive operation, particularly the hermetically sealed mercury switch. Summing up its appearance and performance, the Mercoid Sensatherm is truly the aristocrat among thermostats.
Complete Mercoid Catalog sent upon request.
THE MERCOID CORPORATION
4201 BELMONT AVENUE • CHICAGO 41, ILLINOIS
★MERCOID CONTROLS★
FOR HEATING, AIR CONDITIONING, REFRIGERATION, AND VARIOUS INDUSTRIAL APPLICATIONS

(*Begins on page 76*)

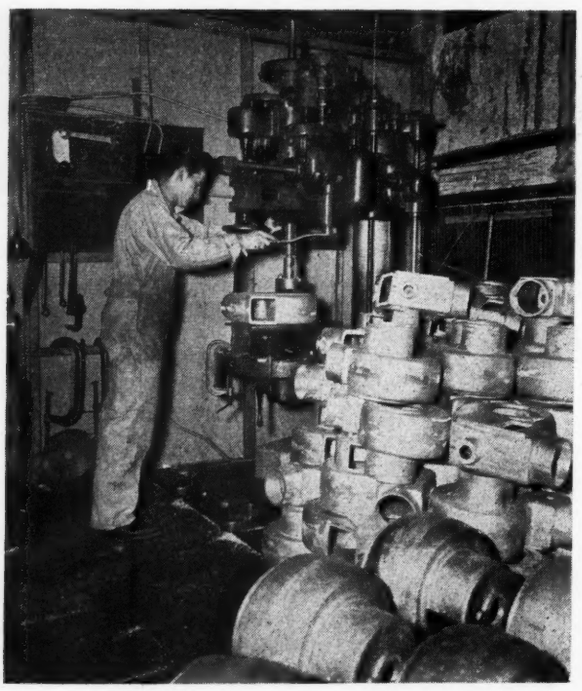
All but one had some college work and 10 are college graduates. About half were former Heil employees.

The trainees do not progress simultaneously, each individual being moved about on a separate schedule. The training time will range from 18 months to 4 years, depending on what the individual is being prepared for, and changes may be made in the program as it advances in order to improve training methods.

The men receive their "on-the-job" training by working in various departments for specified times. In addition, the company runs a school of 2 classes of 2 hours each a week for 12 weeks, at which factory management and supervision officials lecture and conduct forum periods. Subjects covered include industrial relations, blue print reading, mechanical drawing, cost accounting, factory management, public speaking and conference leadership.

The GI's selected are hired as trainees but are paid on a full time basis. They do not receive identical pay, as some with graduate engineering experience are started at a higher rate. Periodic raises are automatic. The Veterans' Administration supplements their earnings with maximum sums based on single or married status, with total compensation not to exceed the minimum journeyman's wage.

One Picture Is Worth Ten Thousand Words...



Silent-Flame Oil Burners are the product of 29 years of oil heating experience.

Models from 1 gallon-per-hour to 20 gallons-per-hour.

Standard Equipment.

Precision Built.

SILENT-FLAME MFG. CO., Inc.

2315-27 Westchester Ave. New York 61, N. Y.

New Gulf Cracker On Stream

GULF OIL CORPORATION has announced that one of the world's largest Fluid cat-crackers is now on-stream at its Philadelphia refinery. This giant installation recently completed is now operating at designed capacity. Embodying all the latest improvements in the Fluid Process, the new cat-cracker serves as the focal point of all refinery operations at the large Philadelphia plant.

Originally scheduled as part of the nation's aviation fuel program, work on the Philadelphia cat-cracking unit began early last year. Located on Gallows Lane, Girard Point, Philadelphia, the new cat-cracker covers an area of more than 100,000 square feet.

General Bronze Official Sees 30,000 Annual Volume

SMALL HEATING UNITS fired with its vaporizing oilburner should reach an annual sales volume of 30,000 units a year, according to Aaron S. Saphier, president of General Bronze Corp., Long Island City, N. Y. The estimate was made in connection with an appeal to stockholders to approve a preferred stock issue to finance a new $2,000,000 plant on a 21½ acre site at Hempstead, L. I. The company also expects to sell 1,000,000 aluminium windows, and various other products to bring total sales to $23,500,000 annually.

U. S. Rad. Extends Bonds

HOLDERS OF $940,000 of United States Radiator Corporation 5% debentures, which matured on August 1, accepted the

(*Please turn to page 84*)

Climatrol stands for "Climate Control"

. . . and for happy customers

"Climate Control For Comfortable Living" is a recommendation you can rely on, as a source of genuine satisfaction which remains uppermost in the owner's mind long after he has forgotten many other details of planning and building his home.

You can be assured of that favorable reaction, when you select Mueller Climatrol equipment. You *know* you are providing True Indoor Comfort . . . not only up to today's higher standards, but also with the possibility of adding future developments to the original Climatrol installation. This is true because the Climatrol system is basically designed to treat and handle *air* — and indoor comfort depends upon the condition of the air in the home.

Climatrol is a product of a reliable manufacturer — a specialist for 89 years in heating equipment exclusively. Each Climatrol unit is specially designed for efficiency with oil. There is a Climatrol to suit every home. Smart, modern appearance. Nationally known, nationally advertised. Be a Climatrol "Comfort Merchant"—and be assured of satisfied customers. *Write for bulletins.*

L. J. MUELLER FURNACE CO., 2009 W. Oklahoma Ave., Milwaukee 7, Wis.

MUELLER Climatrol

Reg. U. S. Pat. Off.

F-25

fuel oil & oil heat

Manufacturers Activities

(*Begins on page 76*)

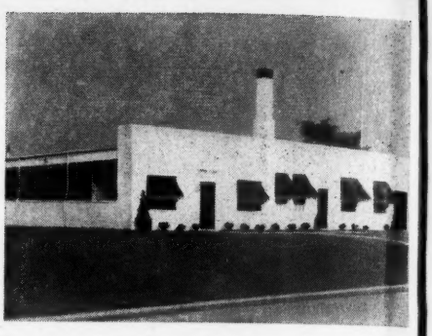
Corporation's offer August 12, to extend their bonds for a period of three years at the same rate of interest, Wesley J. Peoples, Chairman of the Board, has announced. This represented 53.6% of the $1,755,000 debentures outstanding on the maturity date.

Mr. Peoples stated that $567,599 of the debentures or 32.3% of the issue have been paid off in full of principal and interest. Holders of $247,500 or 14.1% of the total have not presented their bonds either for extension or payment.

General Filters in New Plant

GENERAL FILTERS, INC., makers of a complete line of filters for oilburners, have recently purchased and now occupy their own building in Detroit, Mich. The new plant is located in Detroit's west side industrial section at 12890 Westwood Ave.

A. D. Redner, General Filters' president, states that the more adequate facilities for manufacturing which the new



building provides and the additional new and modern machinery which has been installed will enable the company to double its present filter production within the year. Other company officials are Grace Redner, secretary-treasurer and in charge of sales, and Robert G. Gregory, chief engineer.

S-W Plans Fall Production

PLANS FOR FALL production by Stewart-Warner Corporation of a small heating unit for homes were announced today by James S. Knowlson, president and board chairman. The unit has been advanced through all phases of engineering and field testing and will be marketed in limited numbers, the latter part of 1946, Mr. Knowlson said.

Incorporating certain principles of Stewart-Warner's "South Wind" aircraft heating equipment, the new heater will provide advantages of an exclusive nature, Mr. Knowlson indicated.

In April, 1944, the company announced that it was holding for postwar development designs for a unique space-heating unit for home use. Pilot models, manufactured and field tested under varying conditions continuously since shortly after V-J day, have been refined and proved successful to the point that decision to launch production this fall has been reached.

Duo-Therm Furnace Output Planned for Fall Start

DUO-THERM DIVISION, Motor Wheel Corporation, Lansing, Mich., has tentatively scheduled production on a complete new line of fueloil furnaces for fall, according to M. F. Cotes, vice-president.

Present plans call for production of furnaces in three sizes, 50,000 Btu, 75,000 Btu and 104,000 Btu capacity. Eleven models will be offered, ranging from manually or thermostatically operated units for gravity warm air installation to de

(*Please turn to page 88*)

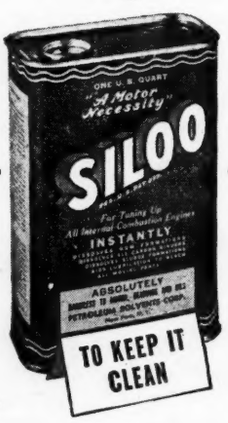
special solvents for 3 important jobs

SILOO FUEL OIL TANK SOLVENT

protects fuel storage tanks and burner equipment. It cleans sludgy fuel oil, Diesel fuel tanks and systems—prevents accumulations of sludge, gum, rust and acid—disperses water due to condensation. SILOO FUEL OIL TANK SOLVENT is 100% safe to use and store.

LOOSITE does a desludging job on engines that is thorough and time-saving. Sludge and gum are dissolved in a safe, gradual way—all working parts are cleaned effectively. LOOSITE is a big help to mechanics when used before teardown of gas and Diesel engines.

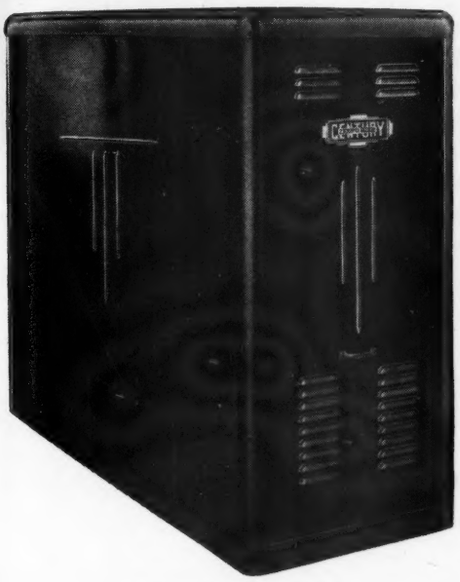
SILOO protects engines by keeping them clean—by holding harmful sludge in suspension. SILOO is perfect for tune-up and breaking-in new and rebuilt engines properly. Helps prevent rust and retards corrosion.
Bought by millions of satisfied users and nationally advertised in the Saturday Evening Post and thirty additional magazines.



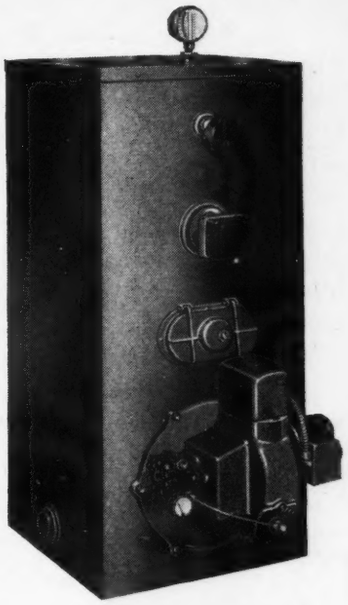
SOLVENTS FOR ALL TYPES OF PETROLEUM RESIDUES
Petroleum Solvents
CORPORATION

General Offices: 331 Madison Ave., New York 17
Petroleum Solvents Corp. of Canada, Ltd., Montreal
Plant and Laboratories: Port Reading, New Jersey

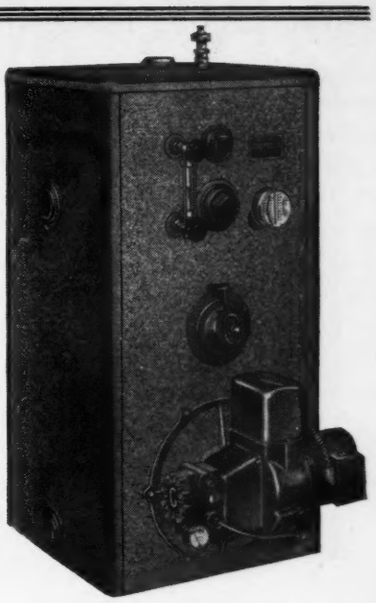
DISTRIBUTORS AND JOBBERS—write for details today!



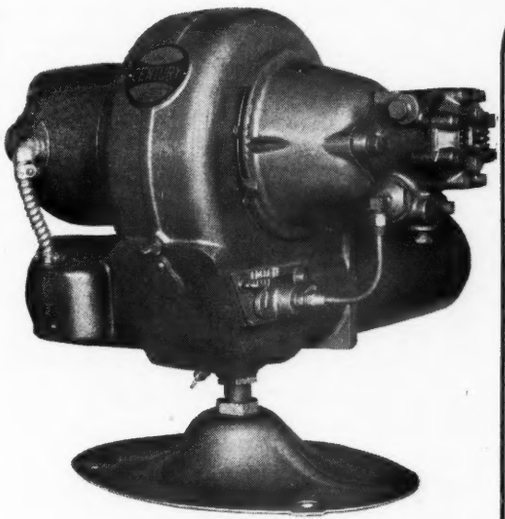
FURNACE BURNER UNIT



DOMESTIC WATER UNIT



BOILER BURNER UNIT



CONVERSION OIL BURNER

CENTURY'S
Complete Line
Assures EXTRA Dealer Profit

The "tie-in" sales alone help Century dealers realize the advantages of handling a complete line of products from one source. A customer intent on buying a conversion burner may find himself more interested in the furnace burner unit. Or he may see the domestic water unit, and buy that, too.

Twenty years of experience and extensive field research combine to create sound design in products built to perform—products that dealers can recommend with full assurance that the purchaser will be well satisfied.

Inquire about the profitable Century franchise. Your dealer profits will mount.

Century engineers work unceasingly to perfect just what every dealer will need to make the most money and build the soundest business in the heating field.

CENTURY
Engineering Corporation
CEDAR RAPIDS, IOWA

OIL BURNERS • BOILER-BURNER UNITS • WARM AIR FURNACES
HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

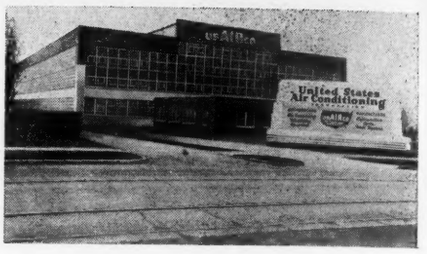
luxe models equipped for forced warm air installation. Blowers are situated behind the unit in the large size furnaces, while the 50,000 and 75,000 Btu capacities will offer models with the blower either behind or underneath the unit. The underneath blower model is designed to save space in utility room installations.

While no Duo-Therm furnaces are now being made, production is underway on the complete new 1946 line of fuel oil space heaters and water heaters recently introduced by the company.

U. S. Air In New Plant

UNITED STATES Air Conditioning Corporation announces that it is now operating in the new plant recently purchased at 33rd and Como Avenue Southeast, Minneapolis, Minnesota. The new building provides approximately 100,000 square feet of manufacturing and office space—plenty of room for the company's vast expansion program.

The Company designs and manufac-



tures a complete line of air conditioning equipment, blowers, fans, air washers, cooling and heating coils, humidifying and dehumidifying equipment, together with pre-engineered package units. Design improvements have recently been made in a number of products, and very soon announcement will be made of the new units which are being added to the line.

Delavan Names Canadian Firm

DELAVAN ENGINEERING CO., Des Moines, has appointed the Radium Development & Engineering Ltd., Toronto, as its Canadian representative. President and general manager of this new organization is Wing Commander Arthur S. Suddes who, with his engineering associates, will handle all sales of Delavan nozzles and accessories throughout Canada.

Wing Commander Suddes was an air corps engineer in both World Wars. For the last few years he has been an engineer-manager with a precision equipment manufacturer in Canada, and for some time has been associated with oil combustion.

Wheelco Appoints for Oregon

WHEELCO INSTRUMENTS CO., Chicago, has announced the appointment of Farnes and Martig, Inc., Portland 14, Ore., as sales and service representatives. The company will cover the State of Oregon.

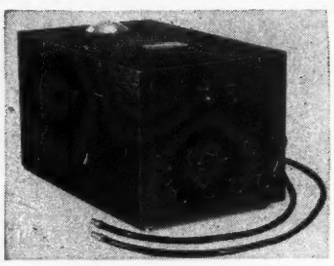
Bickford Expands Distribution

BICKFORD BROTHERS CO., Rochester, N. Y., has been appointed distributor for the complete line of Duo-Therm fuel oil space heaters, water heaters and furnaces, according to an announcement by M. F. Cotes, Vice-President of Motor Wheel Corporation, Duo-Therm parent company.

Bickford will cover, from its Rochester branch, the counties of Monroe, Livings-

(*Please turn to page 92*)

TESTING TRANSFORMERS



Dongan high potential testing transformer for insulation break-down tests. Equipped with primary switch, pilot and safety light. Capacity 250 V. A. Primary 115 or 230 volts, 60 cycle.

Dongan Spec. #7692A—Secondary 2500 volts maximum in steps of 100 volts.
Donogan Spec. #7692B—Secondary 5000 volts maximum in steps of 200 volts.
Donogan Spec. #7692C—Secondary 7500 volts maximum in steps of 200 volts.

Write for Complete Information

DONGAN ELECTRIC MFG. CO.
2981 Franklin Detroit 7, Mich.

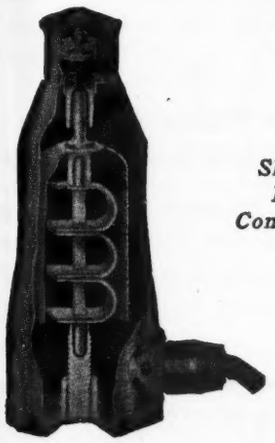
The Dongan Line Since Nineteen-Nine

WRITE FOR LITERATURE

DONGAN TRANSFORMERS

DEVELOP YEAR AROUND SALES

WITH **Nyavco** ORIFICE CONTROL AIR VALVES



Showing Inside Construction

DESIGNED ESPECIALLY FOR OIL BURNING OR AUTOMATICALLY FIRED HEATING UNITS

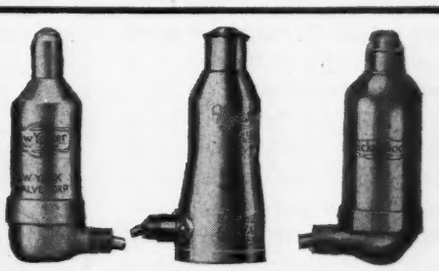
Experience indicates that the sale of high grade air valves suitable for oil burning or automatically fired jobs is not just seasonal business that reaches its peak in September, October and November. Much repair and inspection work is done at other times of year; much modernization work has to be done in warm weather; postwar housing shortages will foster year around new construction.

Whatever the time of the year, men who install and maintain automatic heat know you cannot skimp on air valves. No automatic heating system is better than its balance and a balanced job depends on high grade air valves.

Display and sell Nyavco the year around; quicken heating time; develop fuel economy to meet postwar fuel shortages. Send for catalog and wholesaler discount sheets.

NEW YORK AIR VALVE CORPORATION

611-621 BROADWAY, NEW YORK 12, N.Y.



It's Simple as This - -

Install GENERAL Fuel Oil Filters and Make CLEANER Profits *in More Ways Than One!*

Every GENERAL filter installation automatically results in cleaner burning oil and trouble-free operation. Every installation means added profits to you through cartridge replacement at the time of routine and seasonal inspections.

You also make money by saving money through eliminating unprofitable call backs . . . McGrath of Detroit bears this out by stating, "In the current year they have meant $3000 to $4000 extra to me . . . my chief reason to make sure they are on every oil burner installation is that Call Backs or Repeat Calls, always one of the greatest headaches in this business, are cut to a minimum by GENERALS!"

GENERAL filters offer a golden opportunity to increase your service business by giving your customers better operating fuel oil systems. Write for full details and prices.

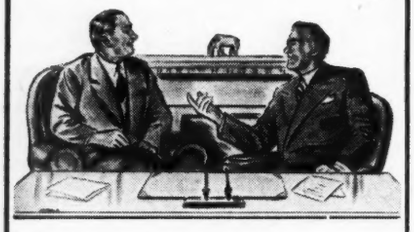
Listed: Re-Examination Service, Underwriters' Laboratories

Deluxe Model 2A-300
Extra large cartridge (63 cu. in.) Holds TWO to FOUR times more impurities than most other filters. Cartridge is pressure sealed to prevent by-passing of oil.

GENERAL FUEL OIL FILTER

GENERAL FILTERS, INC.
12890 Westwood Ave. Detroit 23, Mich.
Canadian Factory Branch: J. C. MacLachlan, 21 King Street East, Toronto.

Economy Model 1A-25
Gives full-season, trouble-free service for average home burner installation. Central bolt holds entire assembly together.



"Cast Iron is ALWAYS a Sound Investment"

Bankers concerned with real estate invariably recommend cast iron for new boilers or for replacement. Experience has taught them these good reasons why cast iron is a sound investment . . .

Cast-iron boilers resist rust and corrosion, thus last longer and may be amortized over longer periods . . . their sectional construction means easier installation or replacement . . . their high efficiency results in consistently-low operating costs . . . they are readily adapted to all fuels.

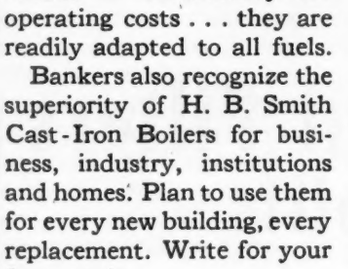
Bankers also recognize the superiority of H. B. Smith Cast-Iron Boilers for business, industry, institutions and homes. Plan to use them for every new building, every replacement. Write for your free catalog.

H.B. Smith

CAST-IRON BOILERS

THE H. B. SMITH CO., INC.
WESTFIELD, MASSACHUSETTS

Offices and Representatives in Principal Cities



Manufacturers Activities

(*Begins on page 76*)

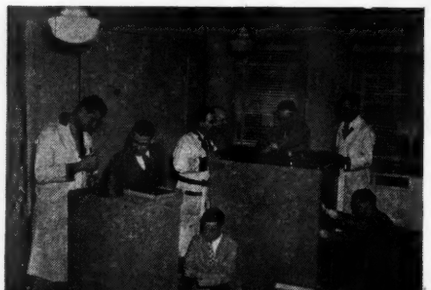
ton, Ontario, Seneca, Steuben, Wayne and Yates. This represents an expansion in the Bickford association with Duo-Therm, since the Bickford Buffalo office is also a distributor for Duo-Therm.

◈

Viking Brings In Its Distributors to School

VIKING MFG. CORPORATION recently ran a series of product and sales schools at its Cleveland offices which were attended by the staffs of distributors' organizations and district representatives. Each school lasted five days and covered heating and cooling equipment and a complete application and installation course.

Merchandising and policy sessions were presided over by H. S. Frasher, president, and Paul B. Patton, vice-president, assisted by executives of the management and merchandising staffs. Mr. Frasher re-



ports that each of the schools was voted highly successful by distributor personnel in attendance. He said this will result in a fully coordinated national standard of service to Viking franchised dealers.

The corporation's sales and general offices and research laboratories are located at 1747 Chester Avenue, Cleveland 14, Ohio, in a two story building recently purchased and completely modernized by Viking for the purpose.

◈

York Names Pure Oil to Distribute in Middle West

THE PURE OIL COMPANY has been franchised by York-Shipley, Inc., York, Pa., to distribute its domestic line of conversion oil burners, boiler-burner units and winter air-conditioners in Minnesota, Iowa, North and South Dakotas and Western Wisconsin. This announcement was made by Victor Lazo, general manager, York-Heat Division on his return from a meeting in Minneapolis attended by forty-two executives and key-men of the Pure Oil Company. The meeting was conducted by E. C. Alft, York-Shipley division manager in charge of the mid-western territory.

◈

Vermiculite Plaster Passes Rigid Test Under Fire

VERMICULITE PLASTER, developed by Munn & Steele, Inc., Newark, N. J., was subjected to a gruelling fire test July 25, for the benefit of the New York City

MEL MODEL "S"

Sausage TYPE TANK GUAGE

Unaffected by Atmosphere . . . is vacuum sealed and impervious to atmospheric conditions. Operated by a portion of hollow, metal floats not supported by liquid in tank. Difference in fuel level alters unsupported weight, changing location of indicator which is supported by spring in plastic sight-tube.

Adaptable for All Size Tanks Mel Model "S" Gauge is adaptable for all size tanks; metal floats can be increased or decreased, and the appropriate spring inserted. For your convenience — *upon request*, your service department will be furnished a chart showing the exact size of spring to be used for each length of gauge, to fit tanks from 22" to 48".

Adjustable in Any Direction . . . in any storage tank, Mel Model "S" Gauge is easily installed in tanks with little or no head room, or where the lever type gauge is impossible.

Mel-Gauge COMPANY

EAST HAVEN, CONNECTICUT

Board of Standards and Appeals. One inch of the premixed plaster was applied over structural steel members in a test furnace and fired for 245 minutes. Temperature readings taken by means of thermocouples were well within the allowable heat on joists, girders and columns.

This plaster also is favorably known for its sound deadening qualities, and the low heat capacity and warmth of vermiculite plastered areas make it popular for use in conjunction with radiant heating.

Oil-O-Matic Introduces Dealer Sales Campaign

WHILE MOST ELEMENTS of the industry are concerned almost entirely with the current problems of production, Williams Oil-O-Matic Division of the Eureka Williams Corporation has introduced a new and aggressive retail sales campaign to its dealers in a ten-city series of meetings, sparked by the slogan "Wake Up and Sell!" The program is well rounded and complete with a wealth of dealer helps and clinchers designed to hold the new customer on the books until delivery can be made and the installation completed.

Dealers, who are inclined to be skeptical at the start of the meetings, are receiving the plan with some enthusiasm, since it is aimed at solving one of the most worrisome problems serious dealers have today; that of holding new sales in times of relatively small production and slow delivery. Though cash deposits, tank installations and other devices are being used to hold the new customer in line, the Oil-O-Matic plan adds the positive desire to own that particular burner, and the willingness to wait for delivery.

Figures revealed at the meetings show that the company has shipped three times as many burners in the first six months of 1946 as was shipped in the same period of 1941, and it is expected that this rate can be maintained and probably increased for the last half. However, all new dealer appointments being made at present are being closed with the understanding that no burners will be shipped to new outlets before July, 1947. All 1946 production is being delivered to existing franchised Oil-O-Matic dealers. The sales program is aimed at helping the new dealers as well as the old dealers, though the new outlets are not to receive burners until existing dealers are fully supplied.

LET'S TALK ABOUT THE MOST IMPORTANT PARTS OF AN OIL BURNER

...The Air Handling Parts

We all agree that the main function of an oil burner is to convert fuel oil to heat. To do this at maximum efficiency, requires an efficient flame. The air handling parts control the flame. Therefore no oil burner is better than its air handling parts.

One or two flame shapes can not meet today's requirements. On every installation, fuel costs can be greatly reduced if the flame can be made to fit the firebox exactly.

Complete Flame Shape Control is offered by HomEase—an infinite number of flame shapes... a different flame to fit every different firebox, exactly—simply controlled from outside the furnace.

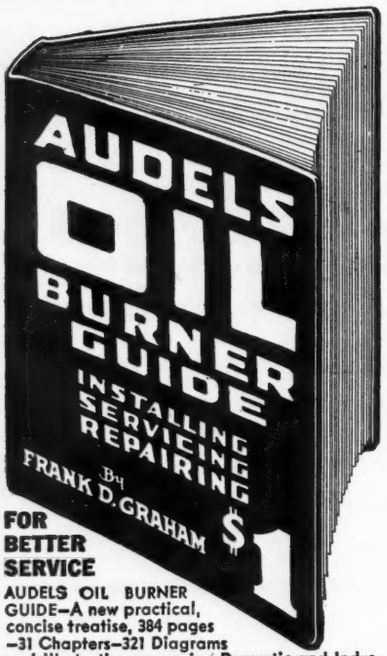
The overall effect of this flame-fitting principle is more efficient mixing of oil and air, considerably higher flame temperature and tremendous improvement in flame shape characteristics.

Any dealer can look at the HomEase Flame and see that it looks different! It is different! And it is more efficient!

HomEase— First With Complete Flame Shape Control

★ **An interesting booklet "First With Complete Flame Shape Control" describes and pictures the revolutionary HomEase Flame. Read how this new flame can save you money on every installation. Write on your letterhead, today. HomEase Products Division, Inc. Department B, Bogue Building, Paterson 3, N. J.**

★ ★ ★ ★ HOMEASE ★ ★ ★ ★



FOR BETTER SERVICE

AUDELS OIL BURNER GUIDE—A new practical, concise treatise, 384 pages —31 Chapters—321 Diagrams and illustrations—covering Domestic and Industrial Oil Burners. New from Cover to Cover. Gives practical inside working knowledge of theory, construction, installation, operation, testing, servicing and repair of all types of oil burners. Includes electrical hook-ups and wiring diagrams of automatic control systems.

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form. Fully illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 days Free Examination.

Send No Money. Nothing to pay postman.

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Please send me postpaid for FREE EXAMINATION books marked (x) below. If I decide to keep them I agree to mail $1 in 7 Days on each book ordered and further mail $1 monthly on each book until I have paid price. Otherwise I will return them.

- ☐ OIL BURNER GUIDE, 384 Pages . . . . . $1.
- ☐ REFRIGERATION & Air Conditioning, 1280 Pgs. 4.
- ☐ POWER PLANT ENGINEERS Guide, 1500 Pages. 4.
- ☐ PUMPS, Hydraulics & Air Compressors, 1658 Pgs. 4.
- ☐ WELDERS GUIDE, 400 Pages . . . . . 1.
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OB7

Readers' Forum

Patchogue, L. I., N. Y.

Editor:

Eighteen or twenty years ago there was some comment on my idea of servicing any make of burner and it being impractical and impossible for one man to have broad enough knowledge to service all makes. But we did it, and so did a lot more boys, which proved that burning oil was a mechanical principal, divided into a few ways of doing it and with controls both mechanical and electrical.

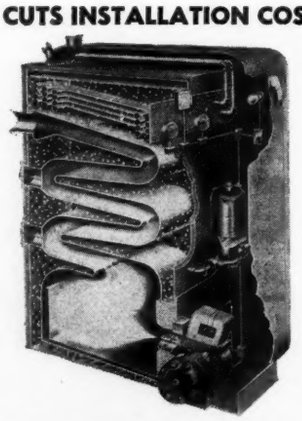
Once a man learned the principle of each method used and applied himself to principal methods of electrical control, he could, when confronted with something new in wiring, easily define their methods and thereupon have the knowledge necessary to service this new equipment.

In the June issue, I see that servicing is still being booted around, with the usual big boy coming through with statistics on cost of a 1,000 to 10,000 service accounts.

This must make the rural service man wonder in amazement at so many accounts, when he serves 150-300 accounts in an area of twenty to twenty-five miles.

Servicing is just an accommodation to the rural man and not a money-making deal. Every Tom, Dick, and Harry is a service man in the country. There is the plumber, heating man, electrician, radio, refrigerator, not counting auto supply and household appliance stores that sell and try servicing. Some service for free, or 50 cents or up to $2.50 a call, and no

CUTS INSTALLATION COSTS



PACKAGED HEAT

Only oil-burning boiler delivered with *controls, burner and circulator mounted and wired at factory!* You just "pick it up . . set it down . . . plug it in!"

Canadian Distributor: Aetrite Equipment Company, 768 St. Paul St., W., Montreal 3, Can.

PENN BOILER & BURNER MFG. CORP.
LANCASTER, PENNSYLVANIA

HomEase Water Softeners Now Contain

NEW BELCOLITE

- **Higher Capacity**
- **More Efficient**

Write for literature on the HomEase Line to Department A, HomEase Products Division, Inc. Bogue Building, Paterson 3, N. J.

THIS kind of "oil burner" could be made out of almost anything... and still do its job. But that's not true of QUIET MAY oil burners.

QUIET MAY standards of precision and performance require none but the finest parts and materials. When we can get enough of them, we'll build all the oil burners our dealers and their customers are waiting for.

QUIET MAY OIL BURNER

MAY OIL BURNER division of **GEROTOR MAY CORP.**
Maryland Avenue and Oliver Street, Baltimore 3, Maryland

fueloil & oil heat

THE FACTS ABOUT THE field

GATE BALANCED AT FACTORY

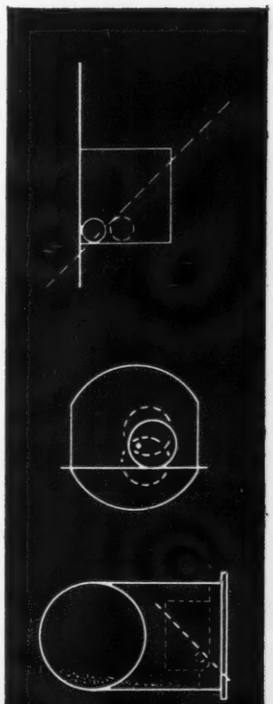
MADE OF HEAVY MATERIAL

DOESN'T CLOG OR WARP

ROLLING TYPE HINGE PIN

QUICKLY RESPONSIVE

FREE SMOKE PASSAGE



ROCKER TYPE FULCRUM

This design — the action of the old rocking chair — means less friction. Less friction means greater accuracy, greater sensitivity, no binding, no oiling, nor corrosion and years of trouble free operation. The hinge pin rolls in slots, instead of twisting in journals.

OFF CENTER GATE MOUNTING

This mounting — coupled with side wings — provides greater sensitivity and greater accuracy. Barometric pressure operates on a greater effective area; the side wings increase the air opening more uniformly, more accurately compensating for each barometric change.

EXTENDED HOUSING

This design places the gate — even in wide open position — outside the flow of gases from the heating unit. Thus the Field Control is not readily fouled by soot, nor will the gate warp from heat. This means longer operating life — no service calls — uniform regulation.

field

CONTROL DIVISION

OF H. D. CONKEY & COMPANY, MENDOTA, ILLINOIS

Increase Your Service Prestige with Customers.

Use RC OIL SEAL in repairing leaks.

RC OIL SEAL remains semi-plastic, insuring a positive seal against both vibration and pressure.

RC OIL SEAL can be used with or in place of gaskets as well as on all threaded connections.

RC OIL SEAL's handy non-breakable plastic container, with brush-in-cap, makes application easy and economical.

Get RC OIL SEAL TODAY

Free sample on request

Write

Ridgefield Chemical Products Company, Incorporated
Ridgefield, New Jersey

Distributor Territories Available

rural service man or company can service on such charges.

There is a way out of all this, and has been thought of before, but no once starts it. It requires organizing, and such a job lies wholly up to the manufacturers to do. Why not register the service man?

Then, advertise him in all national and local papers. Educate Mr. Public to have a registered service man service his equipment.

The manufacturers have done national advertising and spent a lot of money doing it, so that Mr. Public would buy oil heat, and he did. Then why not sell him registered service?

The next step is to register the men and, give them something to show they have complied with the national code of registered service men. A card or some form would show that he is registered.

Most reputable burner manufacturers, in signing up a dealer, are very thorough in securing the right dealer and one with an organization. The new dealer does not have trained men for this new field. Schools at the factory offer to train men for his new enterprise.

Right here the new dealer needs some registered service and installers. If the firm has an experienced force, they will become registered men, and so on until only the free lance man is left, and he surely will want to be registered.

This doesn't seem to be a very great task and it can be done without too much expense. Another feature about this is that it makes a good field to look to for trained specialists, and then again it also assures that these registered men are good men in their work and you can expect better service in the field, and better operating equipment.

Mr. Public will accept the idea readily, realizing it is to his advantage to get the services of a nationally registered service man, indorsed by the industry itself.

The Oilheating Industry as a whole would profit by this, as it would put competent service men in every city, town and village operating to make oilheating the most popular form of heating.

This idea will bring back a lot of service men that have wandered off into other fields. I am sure that the industry will suffer for the lack of trained men when the materials start coming through.

Knowing of all your men, and what's required and what's lacking, educational programs can be offered to them to improve their knowledge and skill. It would be just like one big family all working for the good of the industry. Why! because at last the big fellow has recognized his worth and registered him. This sets him up in his community as a good man, experienced and competent in his work.

Maybe I stepped off the wrong step with this, but it's an idea, and can be worked.

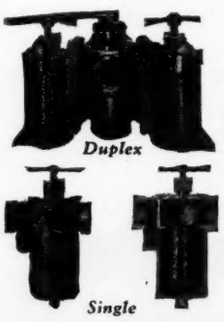
Let's hear the pros and cons on it, maybe someone can suggest something better.

Yours, BILL BRISCOE.

KRAISSL
FILTERS
STRAINERS
PUMPS
Keep Fuel Oil Lines Open and Active

Year-in, year-out performance proves the skill of KRAISSL engineering design and the honesty of KRAISSL manufacture.

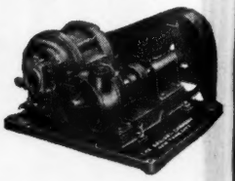
Class 72 Strainers and Filters



Single and Duplex types for suction or discharge service—any practical degree of filtration in units designed for low pressures as well as up to 500 lbs. hydrostatic test—easily removable filter basket insures quick cleaning.

Class 60 Heavy Oil Pumps

Standard equipment wherever independent pump and motor sets or booster pumps for pump-type burners are required.



Submit your fuel-line problems to KRAISSL engineers—literature and prices on request.

295 WILLIAMS AVE.

KRAISSL THE KRAISSL COMPANY
HACKENSACK, N. J.

Lochinvar

Oil Fired WATER HEATER

NEW

STREAMLINED

BASED ON TWO YEARS' DEVELOPMENT

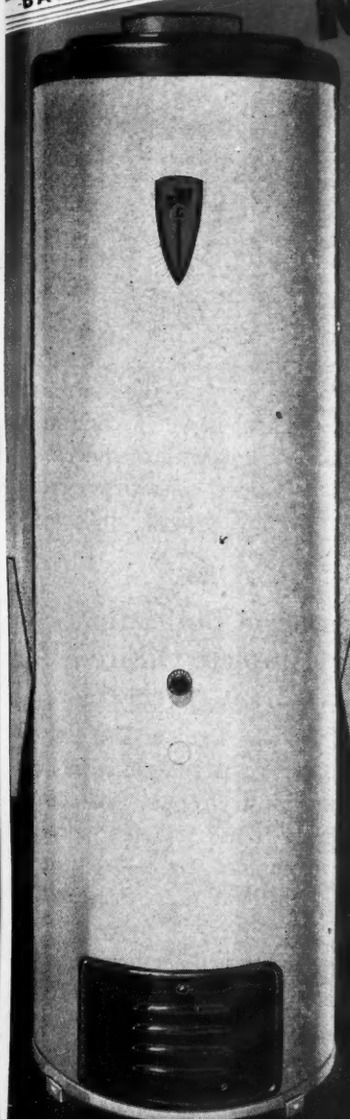
MODELS

- 25 Gallon
- 35 Gallon

NOW

- 60 Gallon

LATER



Lochinvar has a long record of successful operation and consumer satisfaction — low initial cost—low operating cost.

ALL CONTROLS ENCLOSED

with water temperature adjustment at finger tips

LOCHINVAR PRODUCTS

A DIVISION OF

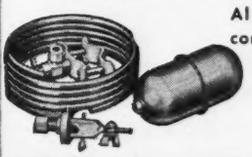
MICHIGAN TANK & FURNACE CORP.

14247 TIREMAN AVE. • DEARBORN, MICH.

Make an Extra Profit on every Furnace "Cleaning Job"

Install the Viking Automatic Furnace Pan Filler

COMPLETE OUTFIT IN ONE HANDY KIT . . .



All the necessary parts and fittings for a complete installation including 6 feet flexible copper tubing, saddle valve, copper float and the Viking Top Seat Float Valve.

INSTALLS IN LESS THAN 30 MINUTES

Make an Extra $5 Bill on every Cleaning or Re-setting job. Costs you only $2.50 for the complete kit. Easily sold; quickly installed . . . carry one with you on every call . . . easily worth $7.50 to any homeowner.

Fill out and mail the order blank today . . .

ONLY YOUR REGULAR TOOLS NEEDED

Drill a ⅛" hole in any convenient water line and attach the saddle valve, drill a ⅜" hole in the water pan and install the float valve, connect the saddle valve and the float valve with the copper tubing and the installation is complete.

Viking

ARMY NAVY FOR EXCELLENCE

AIR CONDITIONING CORP.

5600 WALWORTH AVE. CLEVELAND 2, OHIO

Gentlemen: Please ship at once _____ VIKING AUTOMATIC FURNACE PAN KITS at $2.50

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Bill thru my jobber ☐ Check enclosed ☐

My jobber is _____

We will ship from our nearest jobbers stock, if no preference is shown.

fueloil & oil heat

New Products

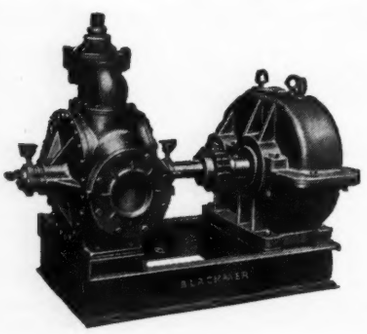
Risselt Valves for Vacuum Or Venting Steam Systems

RISSELT VALVES for venting steam heating systems and holding vacuum systems have been put on the market by the Risselt Division of the Lodge & Shipley Machine Tool Co., Cincinnati 4, Ohio. A feature of the valves is the ease with which they can be taken apart for cleaning. All parts are of brass.

The heart of these valves is the thermal-bellows which seats to close the valves when the bellows is actuated by heat. This construction is used in the J-2 air eliminator valves and the J-3 Vacuumatic valves. J-5 and J-6 stimulator valves are installed on feed and return lines to eliminate air, and to trap condensate before it is forced up into the system.

Blackmer Heavy-Duty Pump

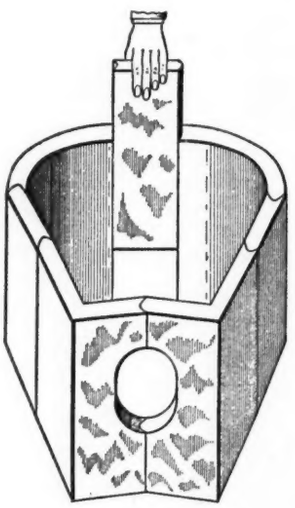
A HEAVY-DUTY PUMPING UNIT with integrally-mounted reduction gear drive has been put into production by the Blackmer Pump Co., Grand Rapids, Mich. The new pump is designed on the swinging vane ("bucket design") principle, which makes it self-adjusting for wear. It has a capacity of 750 gpm at 150 p.s.i. discharge pressure and operates at 225 rpm. The internal construction is bronze-fitted, and units are furnished with either anti-friction or sleeve bearings. The base is structural steel and provides for pump and reduction drive unit only. The prime mover, either engine or electric motor, is mounted separately.



Present plans call for the production of units of similar design with speed variations from 150 to 400 rpm and capacities of 200, 300 and 400 gpm with pressures from 50 to 150 p.s.i. for general industrial as well as marine use. Provision will be made for mounting the prime mover on the common base.

Insulating Refractories In Chambers and Baffles

IRON-HIDE REFRACTORY Products, Matawan, N. J., introduces a line of flame-fitting combustion chambers, comprising a variety of interlocking sections to provide maximum flexibility in meeting boiler and furnace conditions. There are combinations of angular, round and oval shapes, all molded from a quick-heating insulating material. The new line also includes combustion baffles to be suspended over the flame by a newly-devised adjustable baffle support, and made in five diameters from 12" to 20". They are hinged in two pieces so they can be folded to slide through the feed door.



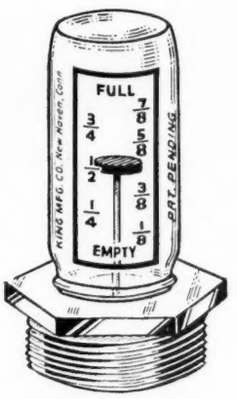
Markets Bellows Wrench

HYDROVALVE CO., New York, has announced a new heavy duty Bellows Wrench for easy and faster servicing of Detroit pressure regulating valves. It is made of hardened steel, and cadmium plated. The 10-in. handle is positioned by turning the knurled pilot which also helps to loosen stubborn retainer nuts.

King Presents New Leak-Pruf Tank Gauge

KING GAUGE & MFG. CO., New Haven, Conn., has announced a new "Leak-Pruf" tank gauge for inside tanks which is claimed to be easy to install regardless of tank contents. A transparent head with vertical scale is supplied either to read in fractions and gallons, or fractions only, as desired.

Styles and sizes are available for all standard horizontal, round or vertical tanks. The bushing is secured in the tank opening, the float is put in position, and the cap screwed on with the fingers. The gauge is of sturdy construction with a minimum of moving parts, and no gears.



Transatherm Boiler for Complete Oilfired Units

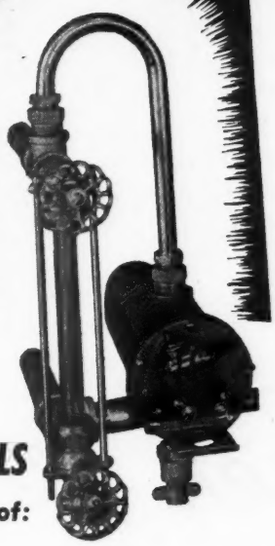
TRANSATHERM, a new steel boiler manufactured by The Ludlow Welding Co., Yonkers, N. Y., is being offered to the oilheating industry for use as a complete boiler-burner unit. It is recommended that the manufacturer ship this unit with burner installed and ready to connect and fire.

The boiler in one domestic size, is made of a special alloy steel, claimed to have four times the life of ordinary boiler plate. A series of elongated fire tubes are placed horizontally above the crown sheet, giving a large area of exposure to water-backed surface.

The manufacturer rates the boiler at 500 sq. ft. of net steam or 800 sq. ft. of hot water. It is claimed that the boiler can be fired at 150% of rating without

No *other* Low Water Cut Off has

ALL THESE FEATURES



...Only NEWARK CONTROLS

offer the advantages of:

ALL BRONZE CONSTRUCTION—Resists rust, scaling and corrosion; prevents possible loss of operating efficiency.

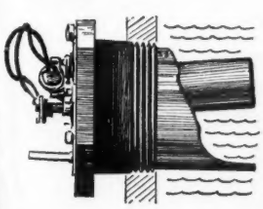
LOW WATER CUT OFF and PRESSURE CONTROL—Combined in a single compact unit; provides double protection.

SIMPLIFIED DESIGN—Sound engineering and simplified design; reduces troublesome sediment problems.

EASY INSTALLATION—External installation of Newark low water cut off is a quick and easy job; accurate fittings for mounting in the gauge glass tappings are supplied.

All these features explain why dealers recommend Newark Controls for positive protection on every type of automatically fired heating boilers. Analyzed point by point, Newark Controls assure better service and greater user satisfaction. Approved by Underwriters Laboratories.

LOW WATER CUT OFF AND ADJUSTABLE PRESSURE CONTROL MOUNTED WITHIN BOILER.



- All bronze rust-resistant construction.
- Engineered to minimize boiler sediment problems.
- A size for every type of boiler.
- Request information on controls mounted inside boiler.

Write today for dealer details on the complete line of Newark low water cut offs with adjustable pressure control.

NEWARK CONTROLS

15 WARD STREET
BLOOMFIELD
NEW JERSEY

Insure **CLEANER AIR** *at Lower Filter Costs*

INSTALL

RESEARCH AIR FILTERS

In Filter Banks and Industrial Dust Collectors

You catch and hold up to 300% more dust—insure higher air blower efficiency with these scientifically engineered air filters. Easy to install, easy to change.

NO. 200 RE-FIL-ABLE WITH SELF-SEALING EDGE

WRITE FOR *FREE* TECHNICAL DATA BOOKLET ON FILTERS AND FILTER BANKS.

RESEARCH PRODUCTS CORP.
MADISON 3, WIS.

fuel oil & oil heat

exceeding 600° stack temperature. It is recommended that the boiler be fired at rates between .75 and 1.5 gph. Heating surface is readily accessible for cleaning.

◈

Down-Draft Boiler for Oil or Gas Firing Ready

FUELMIZER, a down-draft steel boiler which the manufacturer guarantees to reduce heating costs 25% to 50%, has been announced by Advance Engineering Co., Philadelphia. Stack temperatures down to 300° is claimed at firing rates of .75 to 1.0 gph.

The boiler is Scotch marine type with wet base, and the combustion chamber is at the top. Gases leave the combustion chamber at the rear, pass down the back to an economizer in the base, and makes two passes through the economizer. An automatic, thermostatically controlled damper allows a direct pass to the stack for starting. The economizer for oil is made of steel, and of copper for gas firing. Tank or tankless submerged water heating coils are optional.

For Higher

COMBUSTION EFFICIENCY

EDCO

AIR CONES AND STABILIZERS

Use this new EDCO equipment to get a better fire with greater efficiency. Air Cones and Stabilizers work together to give the proper mixture of air and oil.

Sizes available for Air Tubes, inside diameter: 3½", 4", 4¼", 4¾" and 6".

◆

EDDINGTON METAL SPECIALTY CO.
P. O. BOX K, EDDINGTON, PENNA.

Delavan Develops Nozzle Kit

DELAVAN ENGINEERING CO., Des Moines, is producing an oilburner serviceman's kit and the new Delavan Nozzle Tool which is included in the kit.

The new kit is of steel construction and is designed to carry a complete assortment of nozzle tips and adapters and nozzle service tools. Also included is an instruction sheet of useful information for the serviceman.

The Delavan Nozzle Tool is a combination socket wrench and screw driver which enables the serviceman to remove the nozzle from the burner assembly without coming into contact with, or damaging the burner assembly electrodes. With it a nozzle can be taken apart for cleaning and reassembled in one hand, the tool is adaptable to all types of nozzles.

◈

Loline Steel Boiler New For Oil or Coal Firing

LOLINE STEEL BOILER CO., Allentown, Pa., has announced a line of electrically welded steel boilers in residential sizes for oil or stoker firing. Construction and ratings are in accordance with A.S.M.E. and S.B.I. codes.

Flue travel in the secondary surfaces is up and down over a series of rectangular water tubes of the same plate construction as the rest of the boiler. For stoker fired jobs a compartment is provided to catch flyash, requiring cleaning only once a year. This space at the rear of the boiler is recommended for installation of the oilburner on oilfired installations. Jackets are baked enamel on steel, insulated with 4-ply air cell asbestos.

Five sizes are being offered having S.B.I. steam ratings of 442, 630, 765, 1125 and 1500 sq. ft., and equivalent hot water ratings. Recommended oilfiring rate is 1.00, 1.35, 1.65, 2.5 and 3.5 gph respectively. Boilers are designed to go through doors of ordinary width.

◈

Sludge Treatment and Soot Destroyer Offered

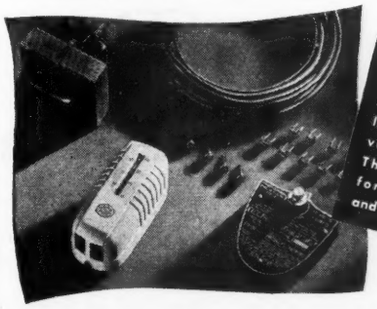
PEROLIN COMPANY of New York has announced Perolin fueloil treatment and Pero-Nite soot and fire-scale remover to the oilheating trade. The fueloil treatment is recommended for commercial and in-

SELL A-P THERMOSTATIC HEAT REGULATOR SETS....To Owners of OIL HEATERS Sold Since 1939

You have a long list of ready prospects for this A-P Heat Regulator Set—all the owners of Oil Burning Space Heaters using any A-P Constant Level Oil Control sold and delivered since 1939.

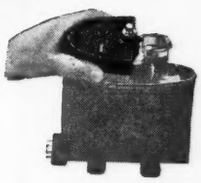
Tell all these old friends how THERMOSTATIC TEMPERATURE REGULATION can be added to their heaters easily and at low cost — with the A-P Model 240-ED Heat Regulator Set. They'll appreciate the convenience and luxury of steady room comfort at the touch of a thermostat dial, and the fuel-saving advantage that will practically pay for the set.

Get ready for this EXTRA sale and profit now! Write for descriptive literature, prices, and samples of advertising and selling material.



A-P Model 240-ED Electric Heat Regulator Conversion Set. Includes: Electric Conversion Top, Wall Thermostat, Transformer, Accessories and Instructions.

Easily Installed — Just mount Electric Conversion Top on present Manual Control and connect to Thermostat and Transformer.



(Be sure your *new* Heater Lines are equipped with A P DEPENDABLE OIL Controls — for faster sales, greater customer satisfaction.)

AUTOMATIC PRODUCTS COMPANY

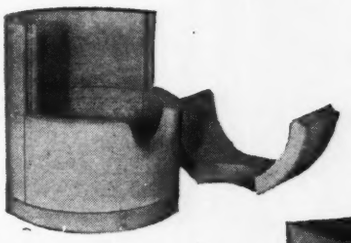
2458 NORTH THIRTY-SECOND STREET, MILWAUKEE 10, WISCONSIN

DEPENDABLE *Oil Controls*

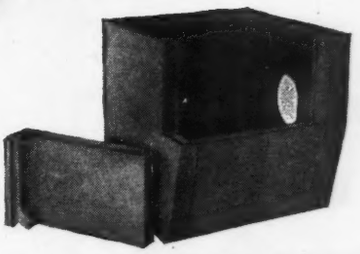
DESIGNED TO ELIMINATE SERVICING

PeTcO

INTERLOCKING COMBUSTION CHAMBERS



VERTICAL CHAMBER



RECTANGULAR CHAMBER

BAFFLE

QUICKLY and easily installed in any style furnace — with any make burner. Arrive at high surface temperatures immediately, insuring *complete* refactory service.

Each section has the exclusive PeTcO *interlocking* joint. Each section is absolutely true in shape and size. No cement required. Free expansion and contraction permitted at all temperatures.

PeTcO chambers are carefully packed in individual carton, complete and ready for installation. No cutting, fitting or wasted material. Just remove sections from carton and set in place.

Get maximum efficiency from all types of heating systems by using PeTcO interlocking Combustion Chambers. Long life, sizes to meet all requirements.

Complete refactory service to the heating industry.

Write for descriptive folder F-96.

PeTcO INSULATING CEMENT

Shrink proof, light in weight, large in volume. Positive insurance against leaks around combustion chamber and air tube.

B. A. PETERSON CO.

DOWAGIAC MICHIGAN

dustrial heavy oil installations to eliminate sludge and emulsify water so it may be pumped out of the tank with the oil and burned. Recommended treatment with Perolin is a quart to each 1000 gallons of oil, and should be added to the tank just before oil is delivered, if possible.

Pero-Nite is claimed to reduce the ignition temperature of soot from 1150° to about 600°, making it possible to burn the soot off heating surfaces. The powder is sprayed into the flame and the resulting gas attacks the soot to reduce its ignition point.

◈

Range Burner Wick Treated And Ventilated to Ban Soot

SCHULTZ MACHINE SHOP, New Britain, Conn., has announced a ventilated range burner wick which is claimed to be specially treated to remove soot from the surfaces of the stove or range, water coils and flue. The wick also is ventilated to allow equalized pressure on both sides of the wick, and allow even burning.

This "Crown Ventilated Soot Removing Band Wick" has a band of treated substance to eliminate soot. After a time the band is consumed and the asbestos wicking is left to operate in the usual manner.

◈

Air Diffuser Combines Supply and Return Features

AIR DEVICES, INC., New York 17, has announced an Agitair RS-42 air diffuser for applications requiring combination supply and return air feature. It is square or rectangular in shape, requiring less headroom than other diffusers, according to the manufacturer.

Both supply and return ducts are run in the same plane with separate connections on the diffuser. Supply air is provided at the ends of the unit, and return air is taken up through the center. Units are available in a number of sizes and patterns with complete diffusion control.

◈

Builds ICHAM Smoke Meter

REFINERY SUPPLY CO., Tulsa 3, Okla., has announced its R-S smoke meter which is built to the specifications of the Institute of Cooking and Heating Appliance Manufacturers. The unit is a photoelectric soot density comparator.

The operation of the instrument is based on the ability of a Pyrex glass rod to pick up soot in flue gases containing oil smoke. The amount of smoke deposit on the rod can be measured in terms of the extent to which it will interfere with the passage of light through the glass rod to a photoelectric cell.

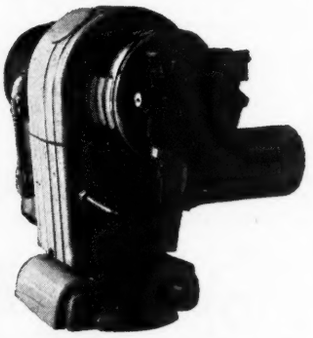
The meter is housed in a metal case approximately 5½ x 5½ x 6½ ins. containing a constant light source which is used for comparisons.

Different!
Exclusive!
Field Tested!

"Quiet Flame"
with
"BAFFLED CONTROLLED AIR"

This patented Burner baffle construction and design featuring, "BAFFLED CONTROLLED AIR," creating an economical "NEW QUIET FLAME PRINCIPLE," is a money maker, an ideal Burner for mass sales.

Available for hot air furnaces and flanged boiler units also. Capacity ¾ gal. to 20 gal.



Quiet Flame Burner Co.
3612 E. Tremont Ave.
New York 61, N. Y.

Everything in ONE Package
One Man Can Easily Carry

R&I Combustion Chamber, bonding clips to hold sections together without cement, and enough Hearth material to make a 1½" thick floor and to cement around oil burner blast tube —all are packed in one strong carton. There are no loose pieces to get lost or mixed.

One man can easily carry this package. The cartons can be neatly stacked.

You get, in one package, everything needed to do a complete job from one responsible manufacturer. And the price is surprisingly low.

Your supply house can furnish R&I Combustion Chambers. Write us for Bulletin OB-98.

Refractory & Insulation Corp.

116 Wall Street — **New York 5, N. Y.**
Chicago 4, Ill. — **Philadelphia 3, Pa.**
Detroit 16, Mich. — **Newark 2, N. J.**

R&I COMBUSTION CHAMBER

THE JACKSON OIL BURNER

OFFERS

ECONOMY • DEPENDABILITY • QUALITY • PERFORMANCE

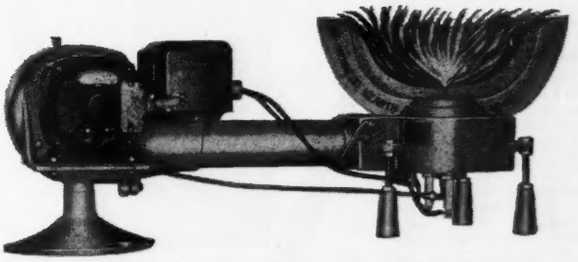
15% To 25% OIL SAVING!

- Fits any gun type burner.
- Easily installed.
- No moving parts in combustion chamber.

made possible by

JACKSON CONVERTER ATTACHMENT

- Extremely quiet in operation.
- Odorless.
- No carbon deposit.
- Moderately priced.
- Increases combustion efficiency of gun type burners 15% to 25%.
- Unbelievably high CO_2.



- Exceptionally low operating cost made possible by a scientifically designed air mixing chamber.
- 80% to 83.5% efficiency by actual test.
- Basket-type flame in suspension fills entire combustion chamber producing uniform heat.
- Time tested and proved in thousands of installations.
- Nozzle never becomes clogged with carbon, no moving parts in combustion chamber, once adjusted, always adjusted.
- Three models all capacities.
- Can be installed in warm air furnaces, steam or hot water boilers.

It will pay you to find out if there is a Jackson Dealership franchise open in your vicinity. We will gladly let you know.

Jackson Oil Burner Company

413 DIME BUILDING — ***CAdillac 3399*** — **DETROIT 26, MICH.**

Stack-O-Meter by Davis For Flue Gas Analysis

FLUE GAS ANALYSIS, stack temperature and draft readings all can be taken by the Stack-O-Meter announced by Davis Emergency Equipment Co., Newark 4, N. J. The company is manufacturing under exclusive licenses the Hebler electric analyzer which was formerly offered by the Wm. O. Hebler Company.

Gas samples are collected through a hand aspirator from the stack. A measuring instrument in the same tube also shows the stack temperature. Draft readings are obtained by a separate tube. All readings are shown on separate scales on the one indicator face of the instrument. Gas analysis is based on the thermal conductivity of the gases by means of an electrical Wheatstone Bridge circuit.

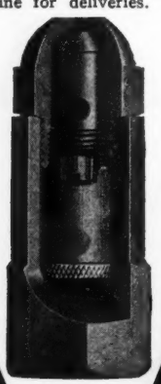
The instrument is contained in a case which carries all necessary equipment. The case is 12 x 13 x 5 ins. and weighs 11 pounds complete. Ordinary flashlight batteries are used, and a safety switch automatically shuts off battery current when the instrument cover is closed.

TAKE A MONARCH "TIP"-- AND COMPARE RESULTS!

Most any nozzle will produce some kind of a fire, but—until you have tried Monarch Stainless Steel Nozzles (of a type with spray characteristics matched to your air mixing equipment) you won't know how good it really should be. State make of burner and sketch or accurately describe air mixing head and make test *yourself* with suitable Monarch Nozzles.

Pulsation: We can usually suggest a remedy. Give full details of burner and the job.

Monarch Nozzles are still so "preferred" by most of the industry that demand far exceeds supply—even though this year we will produce well over 250% more nozzles than were needed for all the domestic burners produced in 1941. Quantity orders must be placed well in advance of required date —with continuous repeat orders to keep yourself in line for deliveries.



Air Cones & Stabilizers

Dealers: It may cost you money if you don't use Monarch stabilizing equipment in combination with Monarch Nozzles for repair work. Their use in combination is really your assurance of satisfactory performance, because every size and style has been thoroughly fire tested in laboratory or field over a period of many years. Eliminate guess work. Use tried and tested equipment.

Replacement Valves

Monarch piston type pressure regulating and cut-off valves are available in several models to suit most replacement needs. G-49 valves can be mounted in any position and piston will not jam from dirt. Contain no bellows or diaphragm to break or corrode.

Write for Catalog D

MONARCH MFG. WORKS, INC.

EAST WESTMORELAND AND SALMON STS.

PHILADELPHIA 34 PENNA.

Quick Coupling Units For Hose Connections

EVER-TITE COUPLINGS for making quick hose connections are announced by the Ever-Tite Coupling Co., New York 19, for use in making hose connections to faucets on a truck or connecting hose lengths together. A special Ever-Tite adaption is for making tight fill box delivery connections.

The standard coupler can be attached to the regular coupling to speed up attachment of hose, and shank type units are available for installation with a band in the hose. Tightness is accomplished by compression on a specially compounded Neoprene gasket in the female fitting. Metal parts are of bronze.

Variety of Fueloil Heaters in M & L Line

FUELOIL HEATERS in a variety of types are being offered by Manning and Lewis, Newark 4, N. J., for warming heavy oil on commercial and industrial installations. They can be used either below the water line or with live steam at working pressures up to 150 lbs. Most units are tested at 225 and 300 lbs.

In the line are cross flow heaters, straight tube, 2-pass U tube, 6-pass U tube, and tank outlet heaters. Cross flow heaters are baffled to get maximum exposure of oil to the steam tube bundle. In cross flow and tank outlet heaters steam is used in the tubes and oil is taken into the shell, but other models are recommended for use with steam or water in the shell and oil in the tubes.

Shells may be cast or steel and tubes are made both of copper and steel.

Herbert L. Laube, formerly with Carrier, has been elected president of Remington Corp., Syracuse, manufacturer of packaged airconditioning equipment.

D. Ray Parker, formerly service engineer for Webster Electric Co., is operating the Seattle Pump Service Co., Seattle, Wash., an authorized Webster service station. Mr. Parker is an old timer in the oilheating business, having spent most of his time in the service field for oilburner and accessory manufacturers.

Over a third of a Century FAITHFUL PERFORMANCE

Listed by Underwriters' Laboratories, Inc. To Burn No. 3 Oil (Diesel) or lighter

KRESKY offers future profits to DEALERS

A pioneer among oil burners Kresky finds such an unprecedented demand today that we are forced to limit shipments to old established dealers. Nevertheless new franchises are being granted now to farsighted dealers who see in Kresky's present oversold condition the promise of future opportunity. ★ The versatile Kresky line is a year round money maker due to its wide applications – heating, cooking and industrial. It includes Conversion Burners, Floor Furnaces, Forced Air Units, Range Burners and Water Heaters. *Write for Kresky Dealer Plan.*

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HEATING • COOKING • HOT WATER • INDUSTRIAL

KRESKY MANUFACTURING COMPANY
Pioneers in Oil Burning Equipment Since 1910
PETALUMA, CALIFORNIA

NU-TROJAN COMBUSTION CHAMBERS

A Product of McLeod-Henry Co.

Make Money for You! Save Fuel for Your Customers!

NU-TROJAN Combustion Chambers are easily and quickly installed. No steel bands are required to hold them in place because its 2" wall thickness and weight supports itself. NU-TROJAN'S construction also gives better combustion, increasing oil burner efficiency. Each chamber is supplied with a "Steel Mixture" Baffle Head and 15 lbs. of Bonding and Flooring material. Fusing point, 3180° F. Write to Dept. 61 for details.

Parts are tongued and grooved for gas and flame tight joints.

A. R. WEBBER CO., Inc.

Everything for the Oil Burner Trade

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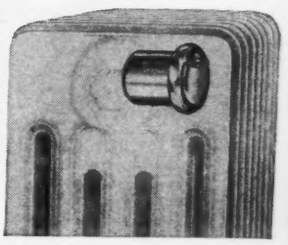
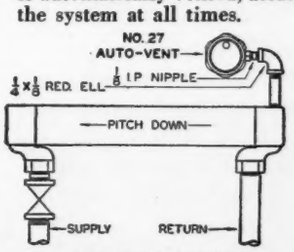
NO MORE AIR-BOUND RADIATORS



with the *NEW* AUTO-VENT AIR ELIMINATOR

Install the No. 27 Auto-Vent Air Eliminator on all radiators and convectors and release that invisible Air Brake that retards circulation. As air accumulates in the radiators or pipe lines it is automatically vented, assuring perfect circulation throughout the system at all times.



No. 27 Auto-Vent Installed on Convector Radiator

You get more even heat and use less fuel.

No. 27 can be installed on convectors, baseboard radiation panels, radiant heating coils, etc., without the use of an air chamber. For pressures up to 50 lbs.

Ask your jobber—Prompt delivery.

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AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

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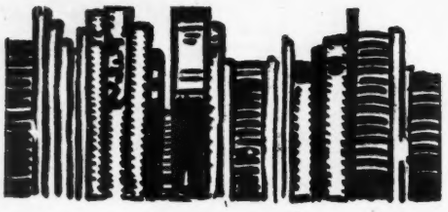

THE BOOK SHELF

Oil Burner Guide Is Primer on Equipment

ANOTHER NEW BOOK on oilburners and oilburning has been announced to the industry under the title "Audel's Oil Burner Guide," by Frank D. Graham. It is a pocket-size, cloth-bound book of 384 total pages and well illustrated.

This book is a primer on oilburning equipment and its construction, and is written in brief question-and-answer form. The form of presentation has some disadvantages for the inexperienced reader since it tells "what" but seldom covers the "how" and "why" of the subject. This sometimes presupposes an understanding of technical subjects the novice does not always have.

The Oil Burner Guide is unusual in a number of ways, and contains a wealth of reference material. A chapter on electrical hook-ups is unusually good, and the section on trouble-shooting has an outline of suggested points of failure that will be interesting to all service men. The brief form of presentation prevents an exhaustive treatment of the "how" side of oilburner service, but the suggestions are helpful.

Audel's Oil Burner Guide is published by Theo. Audel & Co., New York, publisher of a number of technical guide books. The price is $1 a copy.

HERE'S THE NEW *Dwyer* SMOKE DETECTOR

Adjust for Highest —CO_2 and KNOW the Fire Is Clean!

With the new No. 925 Dwyer Smoke Detector you know the exact point when smoke and soot begin. The Dwyer Smoke Detector instantly shows the faint haze that comes before sooty smoke—permits adjustments for highest efficiency without the risk of soot.
Foolproof, simple to operate and can be connected with the CO_2 Indicator to get smoke and CO_2 readings simultaneously.

Send for Bulletin 57
F. W. DWYER MANUFACTURING COMPANY
317 SO. WESTERN AVE., CHICAGO, ILL.

Department of Commerce Has Heating Guide

JUST PUBLISHED by the Department of Commerce is a booklet listing basic information sources for the plumbing and heating and related industries. First, it describes the numerous Government publications having to do with the industry, lists the periodic Census Bureau reports, the simplified practice recommendations, the several Commercial Standards on heating equipment and fuels, all of the industry's trade associations, its magazines, directories, and Department of Commerce field offices. This is a useful reference booklet and may be had without charge. Address C. Muirhead, Industry Division, U. S. Department of Commerce, Washington, 25, D. C., and ask for a copy of "Basic Information Sources, Plumbing, Heating and Associated Industries."

New Revere Manual on Radiant Panel Heating

REVERE COPPER and Brass Incorporated presents "A Graphical Design Procedure for Radiant Panel Heating" by F. W. Hutchinson.

This book is a working manual for designers of radiant panel heating systems prepared by an internationally recognized authority in the field. The data presented cover those ranges of conditions suitable for an economical radiant panel heating system. Calculated values lying outside the ranges given indicate the unsuitability of panel heating in the location under consideration, and would suggest the necessity of structural changes or additional insulation.

HELP WANTED!

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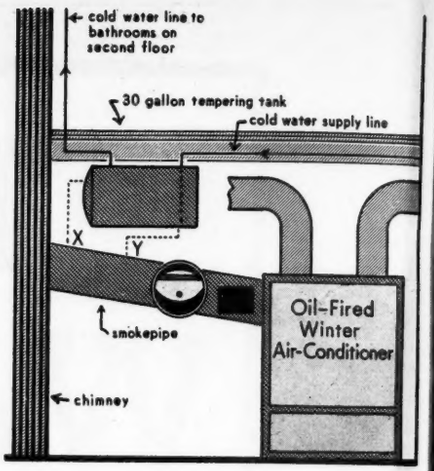
IF YOU *START* WITH QUALITY YOU'LL *STAY* WITH QUALITY

Everyday Snags

Lukewarm Cold Water

Enthusiasm over his winter air conditioning plant and every one of its special features caused the owner of a ten-room house to check closely on the results of using a modern automatic humidifier. He used accurate instruments to measure the relative humidity. Keeping the humidity high in winter did not cause the windows to collect condensation and ice, as it does in many homes. However, small pools of water formed on the floors of the two bathrooms on the second floor of the house, and the plumber could not find any water leaks which caused the pools. After much investigation and consideration of the problem, it was learned that the high humidity of the air in the house caused water to collect on and drip from the toilet tanks in the two bathrooms. The cold water in the house ran exceptionally cold because the well and pump were some distance away and the lines between the pump house and the residence were not very far underground. Water as cold as 45° came from the bathroom faucets. Chilled by this water, the toilet fixtures sweated excessively in winter with the humidity high in the house.



The equipment dealer interested in the problem first suggested reducing the output of the humidifier in the oil-fired air conditioner to eliminate the pools of water in the bathrooms. But the home owner would not hear of this. He said the humidity was at the proper level. Then, after talking over the problem with an air conditioning engineer, the dealer developed the cure for the trouble shown in the diagram. He installed an ordinary 30-gallon hot water storage tank vertically above the smokepipe of the conditioner, to be warmed by heat from the smokepipe. The cold water line which originally supplied the bathrooms on the second floor was piped to feed water to the bottom of this tank, and water with the chill taken from it was drawn from the top of the tank and piped to the bathroom cold water lines.

The dotted lines marked X and Y in the drawing indicate water lines which could be installed to increase still further the temperature of the tank. If necessary these lines would have been connected to pipes or a casting located inside or close to the hot smokepipe. Lines X and Y were not installed, however, as it was found that without them the tempering tank raised the cold water temperature to 75° or higher on most winter days and ended the wetting of the bathroom floors.

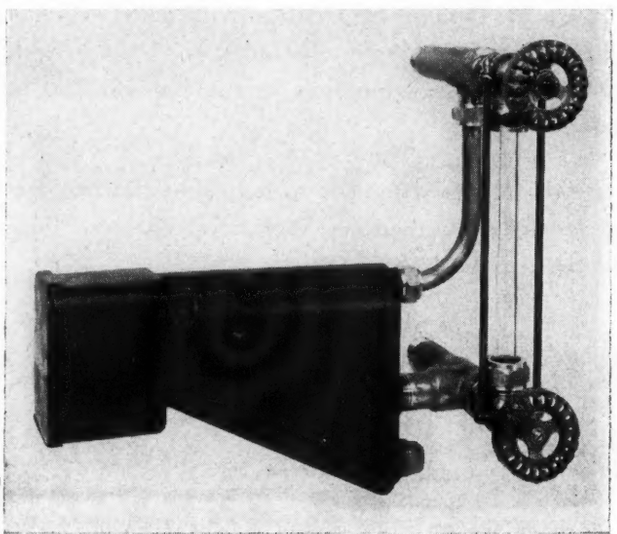
◈

Electrical Trouble

Summoned by one of his servicemen to make a thorough check-up on the wiring of a burner which was giving too many service calls, a service manager found the 110-volt feed line serving other appli-

"ROBEN"
Low-Water Cut-Out
Gauge Glass Installation

Greater Movement
Longer Mercury Tube Life
Snap Action
Bronze Construction



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No Bellows
No Headaches

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The name "Balloffet" is a registered trademark (U. S. Patent Office No. 346,319) and the famous Balloffet design is protected by U. S. Patents No. 1,940,171 and No. 2,107,601.
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ACCURATE
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EXPLOSION PREVENTER

FOR INDUSTRIAL AND COMMERCIAL

OIL BURNERS

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COMBUSTION CONTROL CORPORATION

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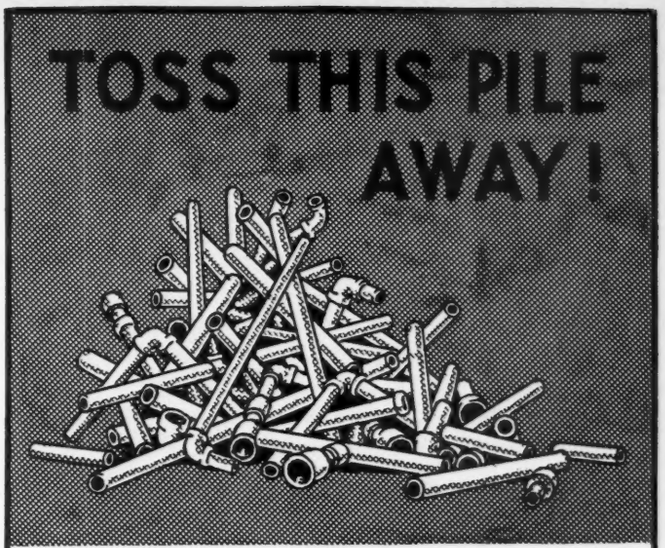
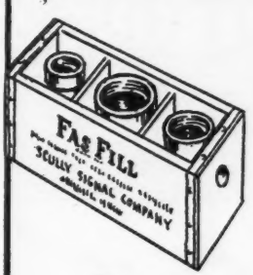




In one SMALL convenient carrying box (weighs only few pounds complete) you can have ALL the connections needed for making up to 1¼", 1½", or 2" male or female fill pipe.

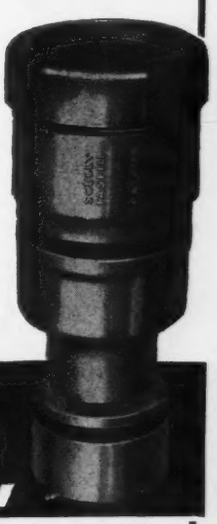
NO WRENCHES NEEDED

A turn of the wrist and FASFILL is in place. Make it up hand tight only. There are long-wearing gaskets at all bearing points to prevent oil seepage. It's a cinch the FASFILL way! Makes slow fills fast fills — eliminates blowbacks and fill drip. Build-ups are unnecessary — worn fill pipe threads make no difference. ANY needed connection is always at hand!

SHOVE THE GUN HOME
LET 'ER GO!

There's a synthetic rubber diaphragm in the FASFILL head. Just shove the gun thru this diaphragm. The interior of FASFILL is designed to hold the gun in correct position. Saves time, saves spills, saves money.

WHEN ORDERING be sure and give us the OUTSIDE measurement across your gun nozzle.



TO MAKE A *QUICK* OIL FILL PIPE CONNECTION USE . . . .

$11.50 f. o. b. factory

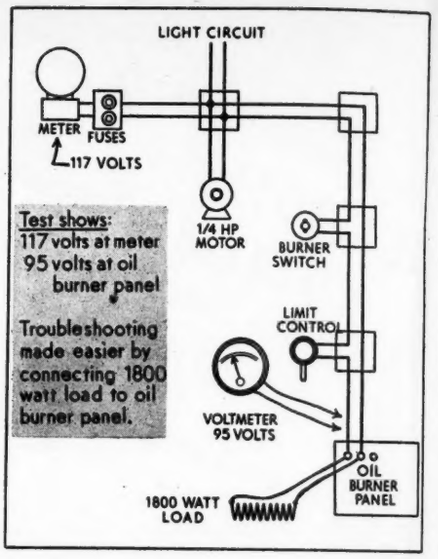
FASFILL

Scully Signal Co., First St., Cambridge 41, Mass.

ances, as the diagram indicates. Two No. 10 wires ran from the fuses of the circuit to a junction box. This box supplied the oil burner circuit, a ¼ horsepower refrigerator motor, and a light circuit newly installed in the house.

To determine if the wiring was responsible for the oil burner breakdowns, the service manager applied a voltmeter to the oil burner panel with the oilburner and refrigerator running. The voltage bobbed up and down, keeping time with the piston of the belt-driven refrigerator compressor. Every time the piston placed a heavy load on the refrigerator motor in travelling upwards, the voltage at the oilburner panel dipped down to 95. A check-up at the meter showed 117 volts with the oilburner and refrigerator running.

Efforts to find out how far the voltage at the oilburner panel dropped with the refrigerator and oilburner starting together were not successful. The voltmeter needle waved back and forth too wildly to permit taking good readings. After putting a jumper around the switch of the high limit control of the oilburner to protect it against overload, the service manager connected an 1800 watt load to the oilburner panel as the diagram shows, and took readings with the voltmeter. With both motors running, the voltage bobbed down as low as 78 at the oilburner panel.



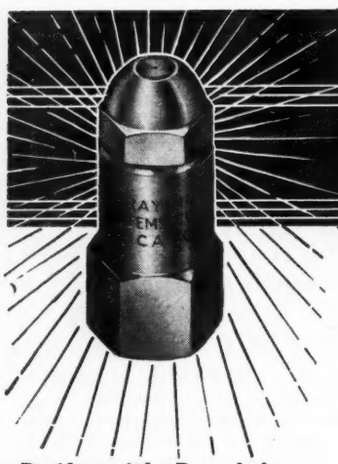
With the 188 watt load still connected to the circuit, the voltmeter was applied across the line at several other points between the meter and the burner equipment. Two weak points in the circuit were found quickly. First, a loose connection under a terminal screw, which under the heavy load caused slight heating, was found in the fuse box. Second, the snap switch in the oilburner showed a switch blade which was under insufficient tension to provide a strong circuit, perhaps because of the load on it being heavier than usual or perhaps because in any event it was defective.

Repairing the fuse box connection and replacing the oilburner snap-switch gave improved voltmeter readings at the oilburner panel and eliminated at least two of the causes of the burner trouble. Using data from the voltmeter to back up its arguments, the oilburner service company is trying to convince the burner owner that separate fuses and a separate circuit should be installed for the oilburner.

Test Job Oil Heaters

THE ACCOMPANYING drawing shows the suction line and return line oil heater arrangement worked out after trials of different arrangements to provide oil at about 100° F. for an experimental domestic burner being tried out on fuel oil heavier than No. 3.

Fitted with a relatively small coil to



SPRAYING SYSTEMS

OILJET ATOMIZING NOZZLE

Built with Precision

To Perform with Precision

OPTIONAL OILJET NOZZLE ASSEMBLY

Supplied without adapter. Consists of (1) brass core, with 18-8 stainless steel core top and welded monel metal screen, and (2) tip with 18-8 stainless steel orifice insert.

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Test This Nozzle...

For Better Oil Burner Operation

You will find the OILJET Atomizing Nozzle well worth the time required for test. Ability of OILJET to improve burner performance has been measurably demonstrated. OILJET operating efficiency is the result of design based on experienced spray nozzle "Know-how" plus maintenance of precision manufacturing standards.

Precision Construction... OILJET parts are precision machined to close tolerances. Wearing parts are Type 303 (18-8) stainless steel. Screen is welded Monel Metal.

Precision Performance... OILJET provides a highly atomized spray of uniform density. Available in capacities from 0.50 GPH upward. Oil volume accurately delivered at rated capacity for given pressure.

If you are an oil burner manufacturer, you are invited to send for OILJET Atomizing Nozzles for test. Please give nozzle dimensional size, spray characteristics, and capacity required.

SPRAYING SYSTEMS COMPANY

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SPECIALISTS IN THE DESIGN AND MANUFACTURE OF SPRAY NOZZLES

EASY TO READ FROM ANY DIRECTION

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PERFECT VISIBILITY!

EASY TO INSTALL!

ONE ADJUSTMENT ONLY!

An exclusive patented feature is the double enclosure of glass and plastic. Another exclusive patented feature is the calibration assembly that prevents oil from seeping into the calibration dome.

Easy to install in all basement tanks, even when partially full.

Made at the factory to fit all tank sizes, and according to individual specifications.

THE ONLY NON-MAGNETIC GAUGE LISTED AS STANDARD BY UNDERWRITERS LABORATORIES

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GREEN BAY, WISCONSIN

SHOOT THE SOOT

NEW CARBOLITE SOOT REMOVER IN GUN

ALL READY TO USE

UNIT 1.00 LIST

Here is one of the fastest-selling, most practical items of the season!

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- AQUATONE—Boiler water rust remover and treatment.
- FUELTONE—Sludge remover.
- SEAL-LEAK—Stops boiler leaks.

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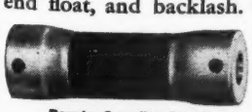
GUARDIAN FLEXIBLE COUPLINGS

For OIL BURNERS

Sleeve end of coupling is close sliding fit on blower wheel hub. Power is transmitted through four spline ribs of coupling fitting four spline grooves in blower wheel hub.

This exclusive direct drive coupling, with rubberized cushion gripped permanently, has no parts to get out of order, or to lubricate. Minimizes misalignment, free-end float, and backlash. Custom-made for specific job. Immediate attention. More than 300,000 tested and proved in oil burners during the last five years.



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Look to GULF for

QUALITY POST-WAR FUEL OIL

GULF

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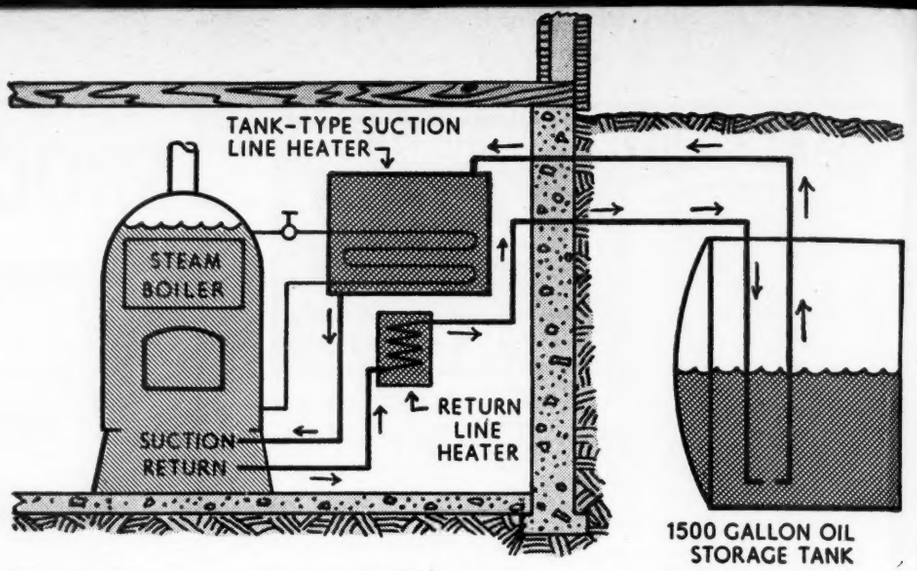
1515 LOCUST STREET PHILADELPHIA, PA.

avoid heating the oil in it to above about 110° under any conditions, the tank-type suction line heater holds about 25-gallons of fuel oil. This heater was found to operate best uninsulated, as then its temperature tended less to become excessive when the boiler steamed steadily for a few hours in carrying maximum load. It is located in a boiler room which usually is about 85° during the heating season.

Keeping air and oil gas from collecting in the tank-type suction line heater was a problem. One arrangement tried, different from that in the illustration, was to connect the suction line to the oilburner to the top, instead of to the bottom, of the tank.



The return line heater raises the 40 gph of returned oil to about 125° when the burner runs steadily and keeps the boiler steaming. Actually, this heater is next to the suction line heater, and its shell is connected to the boiler by a similar under-the-waterline hookup. Valves in the boiler water lines to both the heaters permit regulating their temperatures.

The return line runs to the bottom of the oil storage tank and is fitted with an elbow which directs most of the returned warm oil into a tee which faces the first tee and which is on the end of the suction line stub.

The outside oil lines are buried three feet underground to keep them warmer in winter than they would be closer to the surface, and are not insulated. A temperature control on the boiler, in parallel with the room thermostat, starts the burner at 140° boiler water temperature to prevent long oil burner "off" periods which would permit the fuel oil in the lines and oil burner to chill excessively.

Purely experimental, this layout of oil preheaters has been found to be interesting to development engineers and oil burner dealers who have been experimenting with other arrangements to provide oil which is slightly and steadily warmed for small burners.

◈

Henry Moecker, Jr., has retired as manager of American Stove Company's Cleveland manufacturing division after 50 years of uninterrupted service. *A. W. Leeseberg*, formerly production coordinator of the division has been made manager to succeed Mr. Moecker.

OIL MARKETERS

Heil Truck Tanks deliver bigger payloads, at less cost, with greater safety

A substantial increase in earnings results from the use of Heil Truck Tanks. You see, although Heil Truck Tanks are stronger than conventional units made of the same gauge metal, they are also as much as 15% lighter in weight. This saving in weight permits the carrying of additional gallonage. Operating costs are lower too — that is why Heil users obtain more revenue on every load hauled. Carrying these increased payloads safely is also important. Check the following features — they partially account for the great popularity of Heil Truck Tanks among Oil Marketers:

Undivided Responsibility means prompt, satisfactory service. Heil manufactures the complete unit — not only the tank, but also the hose reels, pumps, power take-off, connecting parts universal joints, valves etc.

Box-Section Longtitudinal Support Members furnish proper support and eliminate troublesome crossmembers.

Deep Dished Heads protect against failure from surging loads.

Welded One-Piece Shell Construction provides maximum longitudinal and transverse strength for protection against tortional strains and stresses.

Low Center of Gravity insures greater safety of operation.

Safe "Seal-Tight" Manholes prevent fire and loss of load in "tipover" accidents.

Leakproof Piping removes the hazard of leaking inflammable liquids.

T-214

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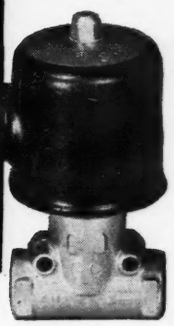

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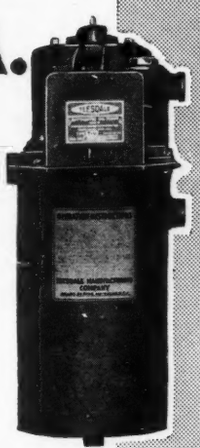

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PREFERRED UTILITIES

Burner and Tank Standards

Conclusion. First Part Was in August Issue

12. GRAVITY FEED TANKS TO BURNER

Gravity feed shall be used only with burners arranged to prevent abnormal discharge of oil at the burner by automatic means specifically approved for the burner with which it is used.

Gravity supply tanks shall not exceed 275 gallons individual capacity. Where more than one gravity supply tank is used, such tanks shall be connected to the feed pipe leading to the burner through a manually operated, approved three-way valve in such a way that only one tank can discharge its contents at a time.

Where oil is supplied to a burner requiring gravity feed and a constant level valve is not incorporated in the burner assembly or in an auxiliary tank used in connection with an automatic pump, an approved constant level valve shall be installed in the oil feed line at the gravity tank or as close thereto as practicable, to insure uniform delivery of oil to the burner. The vent opening of such constant level valve shall be connected by piping or tubing to the outside of the building, unless the constant level valve is provided with an anti-flooding device. Vent piping or tubing or constant level valves shall not be connected to tanks or tank vents, unless authorized by local regulations.

13. PRESSURE TANK FEED TO BURNER

Pressure tank feed shall be used only with burners arranged to prevent abnormal discharge of oil at the burner by automatic means specifically approved for the burner with which it is used.

Pressure tanks shall be approved and shall not exceed a capacity of 60 gallons, and shall not be operated at pressures exceeding 50 pounds per square inch. Pressure tanks shall be equipped with a reliable pressure gauge.

14. TANK VENTS

Storage tanks shall be equipped with an open vent or an automatically operated vent, arranged to discharge to the open air. Vent openings and vent pipes shall be of ample size to prevent abnormal pressure in the tank during filling but not smaller than 1¼ inch pipe size. Heavy oil (No. 6 or Bunker C) storage tanks should have vent lines not smaller than 2 inches.

Vent pipes shall be arranged to drain to the tank. The lower end of the vent pipe shall not extend through the top into the tank for a distance of more than one inch.

Vent pipe shall be installed adjacent to fill pipe.

Vent pipe shall terminate outside of buildings at a point not less than 2 feet measured vertically or horizontally from any window or other building opening. Outer ends of vent pipes shall be provided with a weatherproof hood. Vent pipes should terminate sufficiently above the ground to prevent their being obstructed with snow and ice. Vent pipes of tanks containing heaters shall be extended to a location where oil vapors discharging from the vent will be readily diffused without danger of ignition.

Vent pipes shall not be cross-connected with fill pipes or return lines from burners.

Pressure tanks shall be equipped with an automatic relief valve pipe to discharge outside of buildings.

Vent openings on outside aboveground tanks shall be provided with approved flame arresters.

15. TANK FILL

Storage tanks other than outside aboveground tanks, shall be filled only through fill pipes terminating outside of buildings at a point at least 5 feet from any building opening at the same or lower level. Fill terminals shall be closed tight, when not in use, by a metal cover designed to prevent tampering. No fill line shall be less than 1½" in diameter. Fill pipe should be installed adjacent to vent pipe.

Heavy oil (No. 6 or Bunker C) storage tanks should have fill lines not less than 3" in diameter.

16. OIL GAUGING

All tanks installed shall be provided with a suitable gauge to indicate the approximate oil level in the tank.

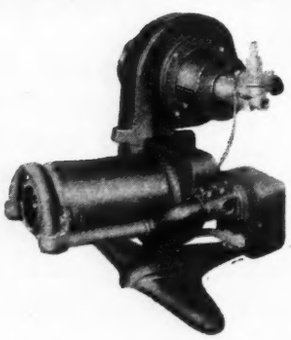
Gauging devices such as liquid level indicators or signals shall be installed so that oil or vapor will not be discharged into the building from the fuel supply system.

A standpipe for stick gauging large oil tanks, shall be provided where practical.

17. PIPING

All piping shall be standard full weight wrought iron, steel or brass pipe with standard fittings or approved brass or copper tubing with approved fittings, except that ap-

ELECTROL



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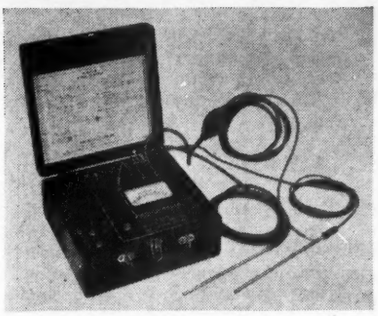

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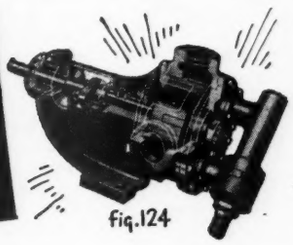

fig.124

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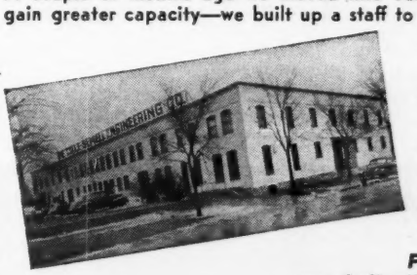

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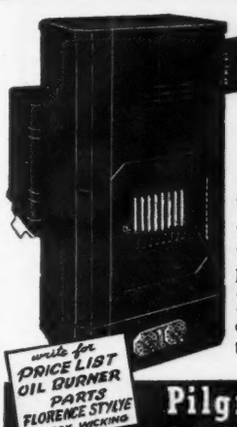

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proved flexible metal hose may be used for reducing the effects of jarring and vibration or where rigid connections are impracticable.

Pipe used in the installation of domestic type burners shall not be smaller than ¼ inch iron pipe size; pipe used in the installation of industrial type burners shall not be smaller than ½ inch iron pipe size immediately adjacent to burner. Copper or brass tubing shall not be smaller in size than the equivalent of the iron pipe sizes mentioned above, with wall thickness not less than 0.035 inch. Flexible metal hose shall be installed strictly in accordance with the limitations of its approval. Suction and return lines for No. 5 or No. 6 oil, between tank and burner, shall be installed in accordance with the manufacturer's recommendations.

Piping shall be rigidly secured in place and protected from injury in a workmanlike manner, and where necessary, shall be protected against corrosion. Where practicable, oil piping shall be buried underground or in a concrete floor or placed in a metal-covered pipe trench.

Pipe joints and connections shall be made tight in a workmanlike manner. Unions and tubing fittings shall be of approved type. Unions requiring gaskets or packing, and right and left couplings shall not be used in oil lines.

Proper allowance shall be made for expansion, contraction, jarring and vibration. Pipe lines, other than tubing, connected to underground tanks, except fill lines and test wells, shall be provided with double swing joints arranged to permit the tank to settle without impairing the efficiency of the pipe connections.

18. VALVES

Readily accessible shut-off valves of first quality shall be installed in oil supply lines near each burner and close to gravity and pressure supply tanks.

Where a shut-off valve is installed in the discharge line of an oil pump, an approved pressure relief valve shall be connected into the discharge line between the pump and the shut-off valve and arranged to return surplus oil to the storage tank or to bypass it around the pump.

Control valves shall be of good quality provided with stuffing box of liberal size, containing removable cupped gland designed to compress the packing against the valve stem and arranged so as to facilitate removal. Valve shall be designed to close against the supply, and to prevent withdrawal of stem by continued operation of the handwheel. Packing affected by the oil or by heat shall not be used.

On all outside tank installations where the feed line is brought up over the basement wall and down into the basement, an antisiphon valve shall be installed.

19. OIL PUMPS

Automatic pumps not an integral part of the burner shall be arranged to stop automatically in case of total breakage of the supply line to the burner.

Pumps used in connections with the supply and discharge of outside aboveground storage tanks shall be located outside of the embankments or dikes surrounding the tanks, and at such a point that they will be accessible at all times, even if the oil in the tank is on fire.

20. TESTS OF OUTSIDE UNDERGROUND TANKS AND PIPING

After installation and before being covered, tanks and piping shall be tested hydrostatically, or with equivalent air pressure, at a pressure not less than 1½ times the maximum working pressure but not less than 5 pounds per square inch at the highest point of the system. Instead of a pressure test, suction lines may be tested under a vacuum of not less than 20 inches of mercury.

Tests should continue for at least 30 minutes without a noticeable drop in pressure or vacuum.

21. COMBUSTION CHAMBERS

Burners shall be installed with combustion chambers in accordance with the recommendations of the oil burner manufacturer, but no combustion chambers shall be installed with less than one inch coverage in thickness on the water leg or mud ring of boilers and shall be carried to a height of not less than three inches on such water leg or mud ring, except in new units where new combustion methods do not require these practices.

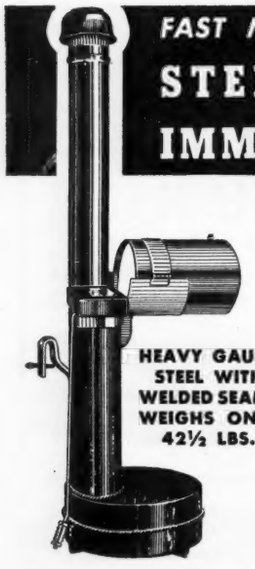
When the burning rate is ten gallons or less per hour, combustion chambers of fire clay brick shall be of first quality brick having pyrometric cone equivalent not lower than 28 (2929°F.).

At rates in excess of ten gallons per hour, brick shall be first quality having pyrometric cone equivalent not lower than 31 (3056°F.).

Bricks shall be dipped into a suitable high temperature cement, rubber and pounded into place.

Insulating fire brick shall be bonded with material recommended by the brick manufacturer and the brick shall be suitable for direct exposure to flame at the following service temperatures:

0—3.0 gal. per hr. — 2000°F. minimum
3.5— 10 gal. per hr. — 2600°F. minimum
Over 10 gal. per hr. — 2800°F. minimum



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THE OIL BURNING HEATER WITH PATENTED-STAINLESS STEEL VAPORIZING BURNER

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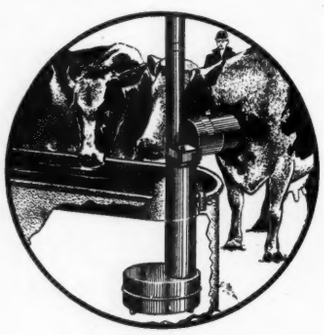

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Precast or monolithic combustion chambers shall be constructed to withstand flame temperatures at the burning rates outlined in the previous paragraph.

Metal combustion chambers shall be as approved and recommended by the oil burner manufacturer and shall be capable of withstanding direct exposure to flame at the following service temperatures:

0—3.00 gal. per hr. — 2000°F. minimum
3.5—plus gal. per hr. — 2600°F. minimum

In the instance of vertical rotary burners requiring hearth construction, the work shall be done in accordance with burner manufacturer's instructions.

Combustion chambers for burners designed by different manufacturers may vary as to temperature requirements and it is therefore recommended that where the manufacturer's recommendations are at variance with the temperature requirements as outlined in this paragraph, that the manufacturer's recommendations be followed, unless local or state ordinances specify that refractories meet specific pyrometric cone tests under certain operating capacities.

Sidewalls and rear wall of combustion chambers, not in contact with heat absorbing surfaces, shall be backed with a non-absorptive insulation. The burning rates for boilers of special design, Scotch Marine and Watertube boilers, design and size of combustion chambers and masonry will be in accordance with the manufacturer's manual or the recommendations of a qualified combustion engineer.

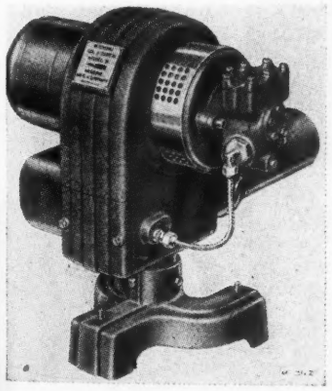
22. INSTALLATION OF BURNERS

Oil burners shall be installed in a workmanlike manner in accordance with the manual instructions of the manufacturer.

Boilers and furnaces in which oil burners are installed shall be connected to flues having sufficient draft to assure safe operation of the burner.

Rooms in which oil burners are located shall be provided with adequate ventilation to assure, sufficient air supply for continuous complete combustion of the oil.

Burners shall be securely fixed in place and shall not depend upon piping for fixation. Burners shall be adequate in size for the service intended and no secondary air openings into the combustion chamber will be permitted on pressure type burner installations in dwellings, unless the burner is specially designed by



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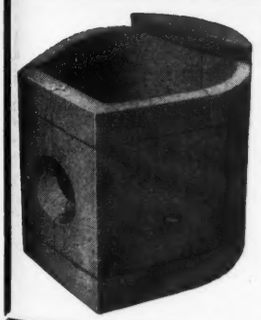

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Cuts Fuel Oil Waste — Increases Heating Efficiency

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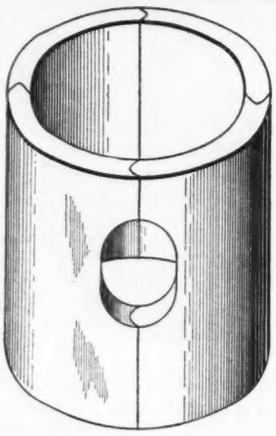

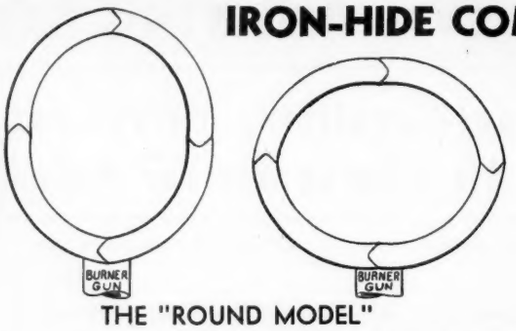

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EXTRA FAST HEATING SURFACE

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the manufacturer to operate with secondary air openings automatically controlled.

23. DAMPERS, SMOKE PIPE AND CHIMNEY

All manually operated dampers shall be removed from the smoke pipe.

Draft over the fire shall be automatically controlled at the intensity recommended by the burner manufacturer. Draft readings shall be taken with the burner in operation and firing at the rate recommended by the manufacturer to satisfy the connected heating load.

Smoke pipe shall be of size recommended by manufacturer of heating unit.

If the smoke pipe is within eighteen (18) inches of combustible materials, fireproofing consisting of one half (1/2) inch of plasterboard or equivalent heat resisting material shall be installed and extend a minimum of twelve (12) inches beyond the limits of such proximity except where masonry walls interfere.

The chimney to which the smoke pipe is attached shall be of sufficient size and have sufficient draft tension to permit the proper operation of the burner. Equipment manufacturers' draft recommendations should be followed.

24. ELECTRIC WIRING AND EQUIPMENT

All wiring and equipment shall comply with local rules and regulations. Where there are no local rules the National Electrical Code shall be followed.

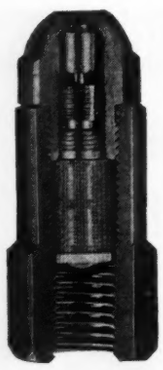
All controls mounted on the smoke pipe shall be so wired as to allow inspection of control elements without having to disconnect wires.

25. OIL BURNER CONTROLS

Oil burning equipment shall be provided with some means of manually stopping the flow of oil to the burner, from a conveniently located point at a safe distance from the burner.

With electrically driven equipment, this may be accomplished by a switch in the motor supply circuit.

Automatically operated oil burners used in connection with hot water, steam or warm air heating systems shall be equipped with automatic devices to shut down the burner in the event of undue pressure in a steam boiler, or overheating within a hot water boiler or warm air furnace.



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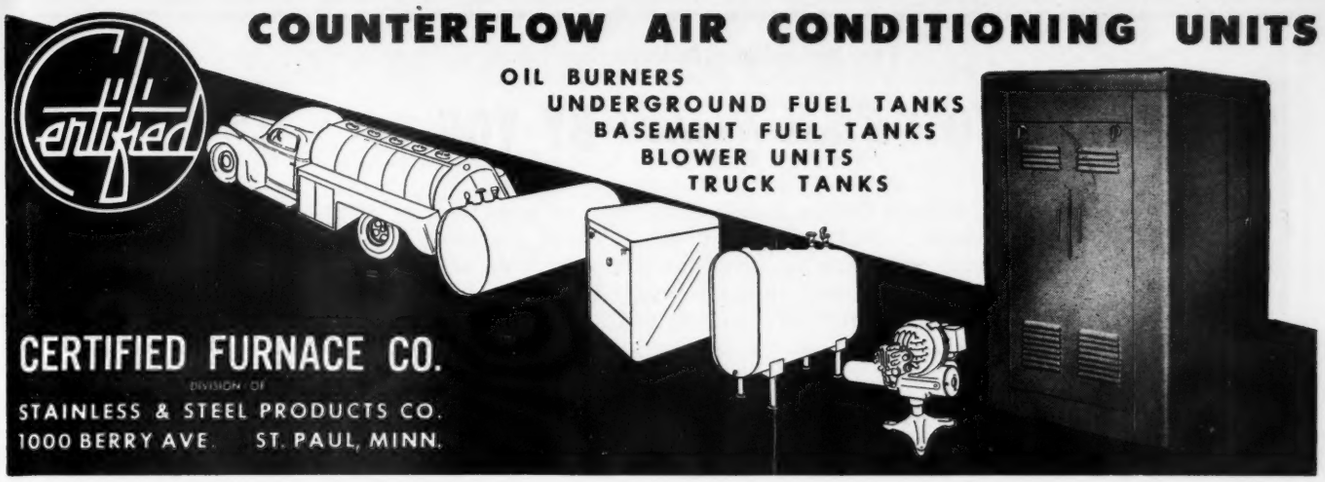

Electric motor-driven industrial oil burners with integral oil pumps, and electric-motor-driven pump sets for use with industrial burners not equipped with integral pumps, shall be supplied with a motor controller incorporating no-voltage protection to be wired into the power supply to the motor.

Non-automatic burners shall be equipped with manual restart controllers.

On non-automatic equipment end equipment where steam or air are used for atomization of the oil, the oil and atomizing supply shall be interlocked with an air-oil switch, so that if any interruption of the atomizing supply takes place, the oil feed will be cut off immediately.

The type and installation of oil burner controls shall be in accordance with regulations of the National Board of Fire Underwriters of Oil Burning equipment, and all ordinances of city or locality where installation is to be made. In case of a conflict between the two authorities, the ordinances shall govern.

All oil burner control circuits shall be wired in accordance with the recommendations of the manufacturers of the controls used on any particular installation.

26. PREHEATING OF OIL

Preheating of oil where necessary, shall be done with steam or hot water or approved electric heaters.

When steam preheaters are used, condensate shall be discharged to some nearby sump, unless sulphur resisting coils or tubes are used within the heater shell. When hot water heaters are used, sulphur resisting coils or tubes shall be used to prevent any pitting caused by bysulphuric acid action within the coils, thereby preventing serious damage to boiler and boiler tubes. High pressure steam preheaters shall have automatic steam control for consistant oil temperatures. Low pressure steam preheaters shall be provided with steam solonoid cutoff valves to cut off the steam supply to the heater when burner or burners are not operating.

When electric preheaters are used on installations where the flow of oil ceases when burner stops, thermostatic control shall be installed, either direct immersion type or remote control. This control shall be installed through an interlocking circuit on the control, cutting off the burner or pumping unit.

Preheating equipment shall be sized in accordance with oil burner manufacturer's installation manual.

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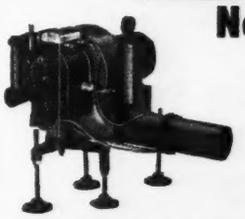

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27. FUEL OIL FOR BURNERS

The grade of fuel oil delivered to and used with any burner shall be that recommended by the manufacturer or the Underwriters Laboratories, which tests and experiences have shown to be suitable for use with that burner. In no case shall the grade of fuel oil used be heavier than that for which the burner has been designed or adjusted to use.

28. FUEL OIL DELIVERIES

All fuel oil deliveries of any grade shall be made in a neat and clean manner so as to build up consumer goodwill towards the oil burning industry.

29. TEST OF BURNER INSTALLATION

Upon completion of the oil burner installation, the installer shall test the operation, covering the following points:

The CO_2 in the flue gas by analysis shall be not less than eight per cent (8%).

Draft: The draft shall be in accordance with specifications in the installation manual of the manufacturer. An automatic draft regulator or its equivalent shall be furnished if required.

Stack temperature: The stack temperature shall be measured on the boiler side of automatic draft regulator and not more than twelve (12) inches from the boiler smoke connection. The stack temperature shall be measured at the certified firing rate. If an automatic draft regulator is built into the boiler or furnace, such regulator shall be closed when the stack temperature is measured.

Firing rate: The firing rate shall be based on the recommendations of the burner manufacturer for the existing total connected load. The burner shall be fired at that rate as a minimum, but not to exceed twenty-five per cent (25%) additional for the maximum rate.

Smoke: During the above test there shall be no visible smoke at the chimney.

The installer shall record the test results and other pertinent information as called for by Commercial Standard CS 75-42, its amendments or revisions or equal. A copy of this information shall be kept in his file for future reference if required.

30. O.H.I. CERTIFICATE OF COMPLETION AND STATE FIRE INSURANCE RATING APPROVAL CERTIFICATE

Upon completion of the installation, the in-

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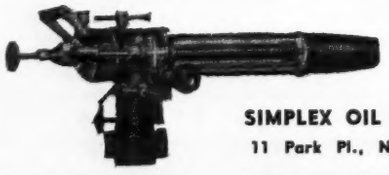

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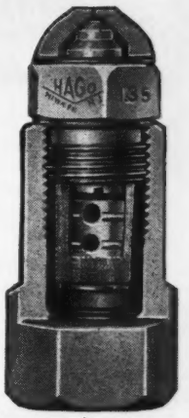

staller shall furnish the owner or purchaser with a completion certificate showing CO_2 developed on test. He shall also furnish owner or purchaser a copy of State Fire Insurance Approval Certificate, or a copy of a certificate of completion or final inspection from the proper local authorities, if obtainable.

◈

Floyd Adams has been appointed branch manager at Richmond, Va., for Burnham Boiler Corp., Irvington, N. Y., to supervise sales in Washington, D. C., Virginia and North Carolina. For the past two years Adams was with Richmond Radiator Co., and before that was for 17 years with Pierce, Butler & Pierce, becoming their general sales manager.

C. S. Hawk, Jamaica, L. I., has been named representative for Ventalarm in the New York Metropolitan area for the Scully Signal Co., Cambridge, Mass. His territory will include Long Island and Northern New Jersey. Mr. Hawk formerly was representative of Utility Laboratory, Inc., calling on the jobber trade.

Burton E. Shaw, former research chief for Penn Electric Switch, chief engineer for Gilbert & Barker, and more recently vice-president of Watts Regulator, has become vice-president of Photoswitch, Inc., Cambridge, Mass.

Allan Coe is the new director of the OPA, Washington, succeeding Gordon Reiley, who has gone to Texas to take charge of a new plant for Bryant Heater Co., Cleveland. This Division has control of prices of oilburners and heating.

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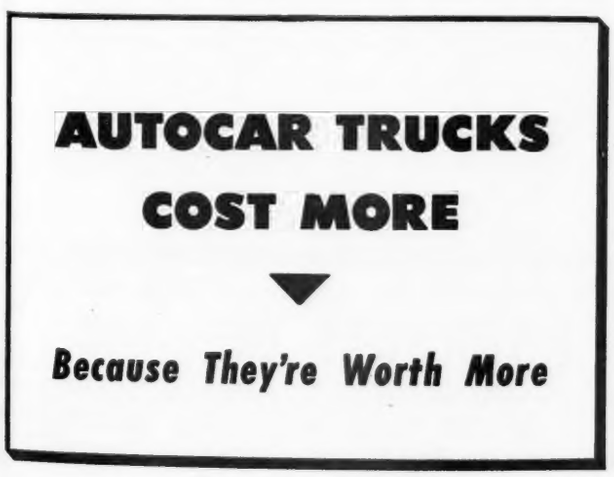

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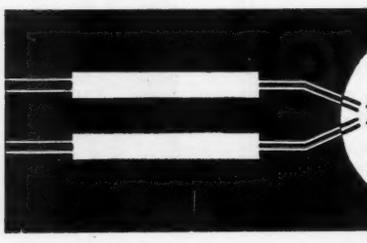

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